

NAVAL WAR COLLEGE REVIEW

Winter 2012

Volume 65, Number 1



Report Documentation Page			Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.				
1. REPORT DATE 2012		2. REPORT TYPE		3. DATES COVERED 00-00-2012 to 00-00-2012
4. TITLE AND SUBTITLE Naval War College Review, Winter 2012, Volume 65, Number 1		5a. CONTRACT NUMBER		
		5b. GRANT NUMBER		
		5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)		5d. PROJECT NUMBER		
		5e. TASK NUMBER		
		5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval War College,,Newport,,RI, 02841		8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)		
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT In what must certainly count as the most newsworthy naval development of 2011, the People's Republic of China obtained its first aircraft carrier. The asyet- unnamed vessel-previously Varyag of the Ukrainian navy (and originally the Soviet navy)-which began sea trials in the Yellow Sea last August, clearly represents an important milestone in the ongoing modernization and expansion of the People's Liberation Army Navy (PLAN). Less clear is what it tells us about the future trajectory of Chinese sea power. In "Beijing's 'Starter' Carrier and Future Steps: Alternatives and Implications," Andrew S. Erickson, Abraham M. Denmark, and Gabriel Collins explore this question through a detailed analysis of what we know about ex-Varyag, how the Chinese may be intending to employ it, and what implications follow for the PLAN generally, as well as for the United States and its friends and allies in Asia and the Pacific.				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 187
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified		

Cover

Orbis terrae compendiosa descriptio, a double-hemisphere projection first published in 1569 by the Flemish cartographer Gerhardus Mercator (1512–94), famous for the eponymous global projection widely used today for, especially, nautical charts. This version was engraved by his son Rumold (1545–99) and issued in 1587.

The map is one of thirty rare maps of similarly high technical and aesthetic value exhibited in *Envisioning the World: The Earliest Printed Maps, 1472 to 1700*. The exhibit, organized by the Sonoma County Museum in Santa Rosa, California, is drawn from the collection of Henry and Holly Wendt. It was on display at the Naval War College Museum from 1 July until 30 November 2011. For further information, visit www.envisioningtheworld.com/.

The image is reproduced by the kind permission of Henry and Holly Wendt and with the assistance of the Naval War College Museum.

NAVAL WAR COLLEGE REVIEW



Winter 2012
Volume 65, Number 1



NAVAL WAR COLLEGE PRESS
686 Cushing Road
Newport, RI 02841-1207

NAVAL WAR COLLEGE PRESS ADVISORY BOARD

Adam Bellow
Capt. Wayne P. Hughes, USN (Ret.)
Jeffrey Kline
Gale A. Mattox
Robert A. Silano
Marin Strmecki
Dov S. Zakheim

NAVAL WAR COLLEGE REVIEW EDITORIAL BOARD

Donald Chisholm
Audrey Kurth Cronin
Peter Dombrowski
Stephen Downes-Martin
Col. Theodore L. Gatchel, USMC (Ret.)
James R. Holmes
Capt. Dennis Mandsager, JAGC, USN (Ret.)
William C. Martel
Col. Mackubin Owens, USMC (Ret.)
Cdr. Derek S. Reveron, USN
Capt. Peter M. Swartz, USN (Ret.)
Cdr. David Teska, USCGR
Scott C. Truver
James J. Wirtz

PRESIDENT, NAVAL WAR COLLEGE

Rear Adm. John N. Christenson, USN

PROVOST

Amb. Mary Ann Peters

DEAN OF NAVAL WARFARE STUDIES

Robert C. Rubel

NAVAL WAR COLLEGE PRESS

Carnes Lord, *Editor*
Pelham G. Boyer, *Managing Editor*
Phyllis P. Winkler, *Book Review Editor*
Lori A. Almeida, *Secretary and Circulation Manager*
Frank Uhlig, Jr., *Editor Emeritus*

Naval War College Review
Code 32, Naval War College
686 Cushing Rd., Newport, RI 02841-1207
Fax: 401.841.1071
DSN exchange, all lines: 841
Website: www.usnwc.edu/press
<http://twitter.com/NavalWarCollege>

Editor, Circulation, or Business

401.841.2236
press@usnwc.edu

Managing Editor
401.841.4552
managingeditor@usnwc.edu

Newport Papers, Books
associateeditor@usnwc.edu

Essays and Book Reviews
401.841.6584
bookreviews@usnwc.edu

Other Naval War College Offices
401.841.3089

The *Naval War College Review* was established in 1948 as a forum for discussion of public policy matters of interest to the maritime services. The thoughts and opinions expressed in this publication are those of the authors and are not necessarily those of the U.S. government, the U.S. Navy Department, or the Naval War College.

The journal is published quarterly. Distribution is limited generally to commands and activities of the U.S. Navy, Marine Corps, and Coast Guard; regular and reserve officers of U.S. services; foreign officers and civilians having a present or previous affiliation with the Naval War College; selected U.S. government officials and agencies; and selected U.S. and international libraries, research centers, publications, and educational institutions.

Contributors

Please request the standard contributors' guidance from the managing editor or access it online before submitting manuscripts. The *Naval War College Review* neither offers nor makes compensation for articles or book reviews, and it assumes no responsibility for the return of manuscripts, although every effort is made to return those not accepted. In submitting work, the sender warrants that it is original, that it is the sender's property, and that neither it nor a similar work by the sender has been accepted or is under consideration elsewhere.

Permissions

Reproduction and reprinting are subject to the Copyright Act of 1976 and applicable treaties of the United States. To obtain permission to reproduce material bearing a copyright notice, or to reproduce any material for commercial purposes, contact the editor for each use. Material not bearing a copyright notice may be freely reproduced for academic or other noncommercial use; however, it is requested that the author and *Naval War College Review* be credited and that the editor be informed.

Periodicals postage paid at Newport, R.I. POSTMASTERS, send address changes to: *Naval War College Review*, Code 32S, Naval War College, 686 Cushing Rd., Newport, R.I. 02841-1207.

ISSN 0028-1484



CONTENTS

From the Editors. 3

President’s Forum 9

Asia Rising

Beijing’s “Starter Carrier” and Future Steps
Alternatives and Implications 15
Andrew S. Erickson, Abraham M. Denmark, and Gabriel Collins

Once China gains experience with its first aircraft carrier, the most important question will concern not the number and capabilities of Chinese carriers but how they will be employed. Beijing could use them to inaugurate a new era of cooperation—or to challenge the fundamental openness and stability of the international system.

The Republic of Korea’s Counter-asymmetric Strategy
Lessons from ROKS *Cheonan* and Yeonpyeong Island 55
Captain Duk-Ki Kim, Republic of Korea Navy

The sinking of ROKS *Cheonan* and the shelling of Yeonpyeong Island must mark a turning point in the defense of the Republic of Korea. The incidents show that the North is turning to asymmetric means to exploit weakness; the South requires counter-asymmetric strategies to deter and defeat them.

Seeking Balance
Force Projection, Confidence Building, and the
Republic of Singapore Navy 75
Swee Lean Collin Koh

In a few decades the reach of the Republic of Singapore Navy has grown from nearby waters to the entire critical Strait of Malacca zone, with visits and operations far beyond. How has it developed, and what are its purposes?

Operational Art

The Port Moresby–Solomons Operation and the Allied Reaction, 27 April–11 May 1942. 93
Milan Vego

The May 1942 carrier battle in the Coral Sea is famous, but the major Japanese operation that brought it about is less familiar. Recently translated Japanese archival sources help put the engagement in its proper context and highlight the lessons it offers for the operational level of war.

Commentary

Foreign Humanitarian Assistance and Disaster-Relief Operations: Lessons Learned and Best Practices	152
<i>Captain Cathal O'Connor, U.S. Navy</i>	

Review Essays

The Tip of the Iceberg.	161
<i>Red Star over the Pacific: China's Rise and the Challenge to U.S. Maritime Strategy, by Toshi Yoshihara and James R. Holmes</i> reviewed by Norman Friedman	
Fair Warning.	164
<i>Maritime Power and Law of the Sea, by James Kraska</i> reviewed by Martin Murphy	

Book Reviews

<i>International Intervention in Local Conflicts: Crisis Management and Conflict Resolution since the Cold War, edited by Uzi Rabi</i> reviewed by Larissa Forster	168
<i>Just War on Terror? A Christian and Muslim Response,</i> <i>edited by David Fisher and Brian Wicker</i> reviewed by Timothy J. Demy	169
<i>In My Time: A Personal and Political Memoir, by Dick Cheney with Liz Cheney</i> reviewed by Stephen F. Knott	170
<i>How the Helicopter Changed Modern Warfare, by Walter J. Boyne</i> reviewed by K. J. Delamer	171
<i>Battle of Surigao Strait, by Anthony P. Tully</i> reviewed by Richard Norton	172
<i>Steam Coffin: Captain Moses Rogers and the Steamship Savannah Break the Barrier, by John Laurence Busch</i> reviewed by John B. Hattendorf	173

Of Special Interest.	176
------------------------------	-----

Reflections on Reading	178
----------------------------------	-----

FROM THE EDITORS

In what must certainly count as the most newsworthy naval development of 2011, the People's Republic of China obtained its first aircraft carrier. The as-yet-unnamed vessel—previously *Varyag* of the Ukrainian navy (and originally the Soviet navy)—which began sea trials in the Yellow Sea last August, clearly represents an important milestone in the ongoing modernization and expansion of the People's Liberation Army Navy (PLAN). Less clear is what it tells us about the future trajectory of Chinese sea power. In “Beijing's ‘Starter’ Carrier and Future Steps: Alternatives and Implications,” Andrew S. Erickson, Abraham M. Denmark, and Gabriel Collins explore this question through a detailed analysis of what we know about ex-*Varyag*, how the Chinese may be intending to employ it, and what implications follow for the PLAN generally, as well as for the United States and its friends and allies in Asia and the Pacific.

In this time of constrained defense budgets in the United States, it is more important than ever to appreciate the contribution that our friends and allies abroad make to the security of this nation and the world. Two articles offer important insight into the current strategic outlooks of two such countries. Duk-Ki Kim, in “The Republic of Korea's Counter-asymmetric Strategy: Lessons from ROKS *Cheonan* and Yeonpyeong Island,” assesses the current state of the threat to South Korea posed by the North, with its increasing reliance on various “asymmetric” strategies to compensate for its own military and economic disadvantages relative to the ROK, as well as for the continuing American military presence on the Korean Peninsula. He argues that, especially in the light of the new aggressiveness shown by the DPRK in such recent military provocations as the sinking of *Cheonan* by a North Korean minisubmarine and the shelling of a ROK-held island off its coast, South Korea needs to be prepared to make radical adjustments in its own preparations to counter or deter DPRK adventurism, both in a peacetime context and in the event of all-out conventional warfare. Captain Kim is a senior officer in the Republic of Korea Navy. In his article “Seeking Balance: Force Projection, Confidence Building, and the Republic of Singapore Navy,” Swee Lean Collin Koh provides an overview of the history, current force structure, and strategic outlook of the naval forces of another nation that has become an increasingly important partner of the United States in the

Asia-Pacific region. As Koh rightly notes, studies of the navies of small nations such as Singapore are not common. But Singapore is particularly deserving of notice in this context, and not only because of its strategic location near the critical Strait of Malacca. Singapore's own naval and other military forces, highly professional and technologically advanced as they are, are not only more formidable than numbers alone might suggest but capable of projecting power in the region to an extent that will undoubtedly surprise some.

The history of the Pacific War continues to provide invaluable materials for the study of naval operational art. In "The Port Moresby–Solomons Operation and the Allied Reaction, 28 April–11 May 1942," Milan Vego focuses on Japanese decision making leading up to the first major clash of Japanese and Allied naval forces in the battle of the Coral Sea. Among the most serious weaknesses in Japanese, as compared with American, military decision making during this period were, according to the author, a tendency to compromise between incompatible plans supported by different commands and the complete inadequacy of intelligence on Allied plans and intentions. Milan Vego is a professor in the Joint Military Operations Department at the Naval War College.

Finally, in "Foreign Humanitarian Assistance and Disaster Relief (FHA/DR) Operations Lessons Learned and Best Practices," Cathal O'Connor provides a useful summary assessment of the recent experience of the U.S. Navy in an important yet understudied area. Captain O'Connor served as deputy commodore of Amphibious Squadron 11 during relief operations off Japan following the earthquake and tsunami of 11 March 2011.

WINNERS OF OUR ANNUAL ARTICLE PRIZES

The President of the Naval War College has awarded prizes to the winners of the annual Hugh G. Nott and Edward S. Miller competitions for articles appearing in the *Naval War College Review*.

The Nott Prize, established in the early 1980s, is given to the authors of the best articles (less those considered for the Miller Prize) in the *Review* in the previous publishing year. Cash awards are funded by the generosity of the Naval War College Foundation.

This year's winner was Toshi Yoshihara, for "Chinese Missile Strategy and the U.S. Naval Presence in Japan: The Operational View from Beijing," which appeared in the Summer 2010 issue (\$1,000).

Three articles were selected for honorable mention: "The Next Geographical Pivot: The Russian Arctic in the Twenty-First Century," by Caitlyn L. Antrim (Summer 2010); "China's 'Antiaccess' Ballistic Missiles and U.S. Active Defense," by Marshall Hoyler (Autumn 2010); and "Talking about Sea Control," by Robert C. Rubel (Autumn 2010).

The Miller Prize was founded in 1992 by the historian Edward S. Miller for the author of the best historical article appearing in the *Naval War College Review* in the same period. This year's winner is Angus K. Ross, for "Four Lessons That the U.S. Navy Must Learn from the *Dreadnought* Revolution" (Autumn 2010, \$500).

NEWPORT PAPER 37

The latest title in our Newport Papers monograph series—*Innovation in Carrier Aviation*, by Thomas C. Hone, Norman Friedman, and Mark D. Mandeles—is now available. It is a description and analysis of how the three key innovations essential to the modern aircraft carrier (the steam catapult, angled flight deck, and mirror-light landing aid) were developed first by the Royal Navy and then quickly adopted by the U.S. Navy. Purchase a copy online from the Government Printing Office (at <http://bookstore.gpo.gov>) or download a pdf version from our website (click Publications, Naval War College Press, and Newport Papers).

TWO NWC PRESS BOOKS WIN NASOH AWARDS

Two books published in 2010 by the NWC Press in its long-running Historical Monograph series (which is sponsored by the Maritime History Department) have won John Lyman Book Awards from the North American Society for Oceanic History (NASOH). Albert A. Nofi's *To Train the Fleet for War: The U.S. Navy Fleet Problems, 1923–1940* won in the 2011 U.S. Naval History category, and Hal M. Friedman's *Digesting History: The U.S. Naval War College, the Lessons of World War Two, and Future Naval Warfare, 1945–1947* in the Primary Source Materials, Reference Works, and Guide Books category. Both are available for sale online by the Government Printing Office, at <http://bookstore.gpo.gov>.

IF YOU VISIT US

Our editorial offices are now located in Sims Hall, in the Naval War College Coasters Harbor Island complex, on the third floor, west wing (rooms W334, 334, 309). For building-security reasons, it would be necessary to meet you at the main entrance and escort you to our suite—give us a call ahead of time (841-2236) or use the phone at the main Sims Hall entrance (1-2236).

STATEMENT OF OWNERSHIP, MANAGEMENT, AND CIRCULATION

Statement of ownership, management, and circulation (required by 39 USC. 3685, PS Form 3526-R, September 2007) of the *Naval War College Review*, Publication Number 401390, published four times a year at 686 Cushing Road, Newport, R.I., 02841-1207. General business offices of the publisher are located at the Naval War College, 686 Cushing Road, Newport, R.I., 02841-1207. Name and address of publisher is President, Naval War College, 686 Cushing Road, Newport, R.I., 02841-1207. Name and address of editor is Dr. Carnes Lord, Code 32, Naval War College, 686 Cushing Road, Newport, R.I., 02841-1207. Name and address of managing editor is Pelham G. Boyer, Code 32A, Naval War College, 686 Cushing Road, Newport, R.I., 02841-1207. Owner is the Secretary of the Navy, Navy Department, Washington, D.C.,

20350-1000. The purpose, function, and nonprofit status of this organization and its exempt status for federal income-tax purposes have not changed during the preceding 12 months. Average number of copies of each issue during the preceding 12 months is: (a) Total number of copies: 8,716; (b)(1) Requested subscriptions (outside Newport County): 7,247; (b)(2) Requested subscriptions (inside Newport County): 202; (c) Total requested circulation: 7,449; (d)(1) Nonrequested distribution by mail (outside Newport County): 135; (d)(3) Nonrequested distribution by other classes: 88; (d)(4) Nonrequested distribution outside the mail: 825; (e) Total nonrequested distribution: 1,048; (f) Total distribution: 8,497; (g) Copies not distributed: 219; (h) Total: 8,716; (i) Percent requested circulation: 88%. Issue date for circulation data: Summer 2011; (a) Total number of copies: 8,854; (b)(1) Requested subscriptions (outside Newport County): 7,136; (b)(2) Requested subscriptions (inside Newport County): 203; (c) Total requested circulation: 7,339; (d)(1) Nonrequested distribution by mail (outside Newport County): 124; (d)(3) Nonrequested distribution by other classes: 111; (d)(4) Nonrequested distribution outside the mail: 1,060; (e) Total nonrequested distribution: 1,295; (f) Total distribution: 8,634; (g) Copies not distributed: 220; (h) Total: 8,854; (i) Percent requested circulation: 85%. I certify that all information furnished is true and complete.

Pelham G. Boyer, Managing Editor





Rear Admiral Christenson became the fifty-third President of the U.S. Naval War College on 30 March 2011. The fourth of six sons of a Navy Skyraider pilot and a Navy nurse, he graduated from the U.S. Naval Academy in 1981.

At sea, he commanded USS McClusky (FFG 41), Destroyer Squadron 21 in USS John C. Stennis (CVN 74), Carrier Strike Group 12, and the USS Enterprise (CVN 65) Strike Group. He most recently served as President, Board of Inspection and Survey. He also served as the antisubmarine warfare officer and main propulsion assistant aboard USS Cook (FF 1083); as aide to Commander, Cruiser Destroyer Group 1 in USS Long Beach (CGN 9); as weapons officer aboard USS Downes (FF 1070); as Destroyer Squadron 21 combat systems officer, in USS Nimitz (CVN 68); and as executive officer of USS Harry W. Hill (DD 986). He deployed eight times on seven ships, twice in command of McClusky.

Ashore, he commanded the Surface Warfare Officers School in Newport, and as a new flag officer he served as Commander, Naval Mine and Anti-submarine Warfare Command, Corpus Christi, Texas. He also served at the U.S. Naval Academy as a company officer, celestial navigation instructor, assistant varsity soccer coach, and member of the admissions board; at Headquarters, U.S. Marine Corps, in the Strategic Initiatives Group; and on the Joint Staff, in J5 (Strategic Plans and Policy) and as executive assistant to the assistant chairman.

He graduated with distinction and first in his class from the Naval War College, earning his master's degree in national security and strategic studies. He was also a Navy Federal Executive Fellow at the Fletcher School of Law and Diplomacy.

Rear Admiral Christenson has been awarded the Defense Superior Service Medal, the Legion of Merit (five awards), the Meritorious Service Medal (two awards), the Navy Commendation Medal (five awards), and the Navy Achievement Medal.

PRESIDENT'S FORUM



Promoting Global Maritime Partnerships

THE OCEANS OF THE EARTH cover nearly three-quarters of the blue planet's surface. They have long been the subject of reflection and study. At Tufts University's Fletcher School the oceans are being examined as *source*, *avenue*, and *arena*: a source for foodstuffs and energy; an avenue for goods, people, and ideas; and an arena for struggle and warfare. This is a simple but elegant rubric for studying this complex environment, one that aligns well with the educational focus we have at the Naval War College. As students of the oceans, naval officers are keenly aware of the centuries of armed conflict that have often turned peaceful waters into scenes of destruction and death.

Stability and progress in international relations are the goals on which the Naval War College's various Global Maritime Partnership programs are focused. Although the College's doors have been open to frequent international visitors since the end of the nineteenth century, the foundation of our current international academic programs can be traced to the desire of Admiral Arleigh Burke, as Chief of Naval Operations (CNO), to enhance the ability of NATO allies and other treaty partners to work together effectively on issues of common concern. Burke recalled discussions he had once had with a former Imperial Japanese Navy officer after the close of World War II. That officer bemoaned the possibility that despite their remarkable tenacity and operational excellence the Japanese had lost the war because of inadequate scholarship in military schools. Admiral Burke countered that more interaction among military professionals (at places like the Naval War College) might have prevented the war from occurring at all. To encourage such potentially beneficial contacts, he directed the formation of a permanent location for professional discussion and debate. In the

summer of 1956, officers from twenty-three nations gathered in Newport for the inaugural class of the College's first full-time international program, the Naval Command College (NCC). This yearlong course paralleled, to the degree that security restrictions would allow, the course of study followed by U.S. students. When highly classified topics, such as nuclear operations, were covered, the NCC students engaged in professional visits to military, industrial, and governmental institutions around the country.

Today's NCC welcomes top-performing officers from over sixty nations each year in a course of study that is almost fully integrated with the academic program of our U.S. students. In the fifty-five years that have passed since the first course, the Naval Command College has graduated nearly two thousand officers from more than a hundred friendly nations. With the success of this program as inspiration, in 1972 a tailored version of the yearlong program, to be completed in only five months, was established as the Naval Staff College (NSC). Over the years, more than 2,100 officers, many from the world's smaller navies, have graduated from this highly regarded program. The over 4,100 alumni from these two programs constitute a remarkable network of maritime professionals who share not only a love of the sea but also deep and personal appreciation for the strengths of their fellow mariners, their nations, and their cultures.

In addition to these on-campus international education programs, the College conducts conferences, symposia, and other research and collaboration initiatives on a recurring basis. Here are just a few.

The International Seapower Symposium. The largest gathering of naval leaders in history just occurred in Newport, when the twentieth International Seapower Symposium (ISS-20) was held at the College on 18–21 October 2011. Addressing the theme "Security and Prosperity through Maritime Partnerships," the ISS was attended by chiefs of navies and coast guards from 111 nations. This event, hosted by the CNO, has been held here in Newport every two years since 1969, the only exception being 2001, in the immediate aftermath of 9/11. The symposium offers an incredible arena for the world's maritime leaders to discuss common challenges and to promote international maritime security cooperation. These discussions offer opportunities for future regional and international collaboration in seeking solutions to challenges facing the global network of maritime nations. The ISS is unique in that it is the only forum in the world that regularly brings together the heads of navies to enhance maritime security and collaborative operations. Leon Panetta, the Secretary of Defense, welcomed the delegates in a video in which he highlighted the purpose of the symposium: "Lifting all of our nations towards a better future is what this is all about. On behalf of President Obama, I want to thank you for your service and for your

collective efforts to promote a more peaceful, a more stable, and a more prosperous world.” The CNO, Admiral Jonathan Greenert, reiterated the value of mariners working together: “Maritime security is impossible for one nation. No one can do it alone. It’s a team effort. It’s a team sport.” In his keynote address, the Secretary of the Navy, Ray Mabus, encouraged the assembled leaders to “seek out ways to work together and take advantage of the common bond between sailors that share one culture and one sea-going tradition that has been two millennia in the making.” He went on to acknowledge the value of international maritime partnerships, declaring, “The best response [to any problem] is one heard from many voices.”

Discussions at previous ISS events resulted in many successful efforts to enhance cooperation in countering piracy, providing disaster relief and humanitarian assistance, coordinating search and rescue at sea (including submarine rescue), and planning and conducting coalition military and joint law-enforcement operations to counter arms, drug, and human trafficking, and fisheries and pollution violations. Building on a common understanding of the most pervasive challenges faced by the maritime nations, ISS-20 provided the delegates with numerous opportunities to foster trust and confidence.

Regional Alumni Symposia. Many of the advantages of the biennial ISS are realized on a more frequent basis through a series of Regional Alumni Symposia held at venues around the globe. Since 2005 the College has hosted eight symposia at various regional locations as opportunities to reunite alumni of our resident international education programs. The most recent event, cosponsored by the French Navy, was held in Toulon, France, in September 2011. It brought together alumni from throughout the European region. The symposium’s theme, “Enhancing Regional Stability: NATO’s New Maritime Strategy and Other Initiatives,” built on concepts for enhancing global maritime partnerships that had been discussed in depth during the International Seapower Symposium of 2009. In Toulon, symposium participants examined existing cooperative structures and investigated future possibilities for enhanced interoperability and information sharing in the region. The aim of this event, as for the other seven symposia held since the series began, was to use our alumni’s shared experiences in Newport to enhance trust and confidence and to facilitate ongoing cooperation. The meetings allow alumni to interact and exchange views with one another, with the College’s faculty, and with U.S. senior military leadership from the region. They support the goals outlined in the U.S. Navy’s “Cooperative Strategy for 21st Century Seapower” by promoting collaboration, sharing ideas, and encouraging and facilitating future cooperation. The Regional Alumni Symposia also provide unique forums at which regional and fleet commanders and their staffs can

engage directly and informally with a cross section of international graduates from both the NCC and NSC.

Regional Studies Groups. On our home campus in Newport, we have established six Regional Studies Groups (RSGs) to facilitate faculty and student research in support of the College's mission to provide direct support to the CNO and the geographical combatant commanders. The Regional Studies Groups now in operation are Europe-Russia Studies, Greater Middle East Studies, Latin American Studies, Africa Studies, Indian Ocean Studies, and Asia-Pacific Studies (closely associated with the Van Beuren Chair of Asia-Pacific Studies).

Each RSG comprises faculty members and students with expertise, experience, and interest in the U.S. policy and maritime affairs of the designated region. The RSGs act as catalysts, coordinators, and implementers of research that serves the needs of the Navy, combatant commanders, and other elements of the U.S. government responsible for formulating policy, developing strategy, and devising operational plans for each area. Within the College itself, the groups serve as focal points for information sharing related to major policy developments within the regions. The groups also perform important outreach functions by facilitating faculty participation in major conferences and research activities in the various regions and throughout the United States.

China Maritime Studies Institute. The maritime relationship between the United States and China will be particularly critical to the world's maritime security in the twenty-first century. China's rapidly expanding overseas commerce and the growth of the People's Liberation Army Navy are facts that deserve and demand considerable study and analysis. Just over five years ago the College established an organization, and recruited superb young Mandarin-speaking faculty, to enable such studies to take place. The China Maritime Studies Institute (CMSI), established to increase knowledge and understanding of the maritime dimensions of China's rise, supports the research needs of the U.S. Navy and the larger academic community. The CMSI conducts research in functional areas including energy, global commerce, law of the sea, maritime technologies, merchant marine, naval developments, naval diplomacy, and shipbuilding. The institute's many published books and monographs have become "required reading" for China scholars around the world. Its contributions to the body of knowledge in the field continue to grow each day.

Combined Force Maritime Component Commander Course. The recognition of the importance of allies being able to interact smoothly in operational situations created the demand for a specialized course that would enhance the abilities of senior officers to work together effectively. The Combined Force Maritime Component Commander (CFMCC) Course was developed to promote

understanding and regional awareness while cultivating positive relationships among U.S. and international flag and general officers. At least half of the students in these regionally focused courses, which are cohosted by the appropriate fleet commanders, represent the military forces of the region. To facilitate participation and reduce travel requirements, the courses are held in the respective theaters. CFMCC courses have explored the issue of command above the tactical level, looking at the art and science involved in operating naval forces in a multinational environment. They have focused on cooperation and collaboration using scenarios based on joint and combined exercises or humanitarian assistance and disaster response operations. The CFMCC courses have had a significant impact in helping regional teams address such challenges as piracy, earthquake response, and tsunamis. For example, graduates from New Zealand and Japan of the course held in Pearl Harbor in February 2011 returned home to find themselves almost immediately leading real-world missions in response to disasters in their countries. The shared experiences of that CFMCC course were in that instance of immediate and real benefit to the world.

This is only a brief overview of some of the ways the Naval War College is working, with many international partners, to encourage peace and stability. Individually, navies can accomplish much good for their nations, but collectively they can do much of the hard work required to make the ongoing globalization of benefit to all.



JOHN N. CHRISTENSON

*Rear Admiral, U.S. Navy
President, Naval War College*

Dr. Erickson is an associate professor in the Strategic Research Department at the U.S. Naval War College, a founding member of the department's China Maritime Studies Institute, and an associate in research at Harvard University's John King Fairbank Center for Chinese Studies. Erickson received his PhD and MA in international relations and comparative politics from Princeton University. His research has been published widely, and he is coeditor of and a contributor to the Naval Institute Press book series Studies in Chinese Maritime Development, the latest of which is Chinese Aerospace Power (2011). He is also cofounder of China SignPost™ 洞察中国, www.chinasignpost.com.

Mr. Denmark is an Asia-Pacific Security Adviser at CNA and a member of the 21st Century Leadership Council at the National Committee on American Foreign Policy. He was previously a Fellow with the Center for a New American Security and served in the Pentagon as Country Director for China Affairs in the Office of the Secretary of Defense. He is widely published in Asia and the United States and has authored several reports on U.S. policy and strategy toward the Asia-Pacific region and the global commons. Mr. Denmark received a master's degree in international security from the Josef Korbel School of International Studies at the University of Denver and studied at China Foreign Affairs University and Peking University.

Mr. Collins is a private-sector investment analyst and a former Naval War College research fellow. He is cofounder of China SignPost™ and is a JD candidate at the University of Michigan Law School.

BEIJING'S "STARTER CARRIER" AND FUTURE STEPS

Alternatives and Implications

Andrew S. Erickson, Abraham M. Denmark, and Gabriel Collins

Just as a newlywed couple wants a "starter home," a new great power wants a "starter carrier." China's navy has finally realized its longtime dream of obtaining an aircraft carrier and sending it to sea. This is the first step in a long journey that will change China's navy and how it relates to the world.

At 5:40 AM local time on Wednesday, 10 August 2011, more than eighty years after the idea was originally proposed, China's first carrier disappeared into the fog under tight security from Dalian harbor's Xianglujiao Port, in northeast Liaoning Province, to begin sea trials in the Bohai and northern Yellow Seas. This was yet another coming-out party for China as a great power on the rise. Upon its launch, the nation burst with patriotic pride over the achievement. Major General Luo Yuan, deputy secretary-general of the China Society of Military Sciences, declared, "Well begun is half done. . . . [T]he effect of having something is completely different from the effect of having nothing."¹ Plans are under way to commemorate this new era of Chinese sea power, and to boost the economy further in the process. Tianjin, one of the country's four municipalities, plans to do its part in October 2011 by opening China's first aircraft carrier-themed hotel, based on *Kiev*, once the Soviet Pacific Fleet's flagship and now the centerpiece of the Tianjin Binhai Aircraft Carrier Theme Park. A Chinese flagship as capable as *Kiev* once was remains far away, but Beijing has taken the first step and is already reaping added influence at home and abroad.

Before foreign strategists start hyperventilating about the "beginning of the end," however, a deep breath is needed. China's initial carrier foray followed a six-year refit and lasted only four days. China's starter carrier—a vessel originally purchased incomplete from Ukraine in 1998—is of very limited military utility; it will serve primarily to confer prestige on a rising great power, help the Chinese

military master basic procedures of naval airpower, and project a bit of military power—perhaps especially against the smaller neighbors on the periphery of the South China Sea. This is not the beginning of the end; it is the end of the beginning. To realize its ambitions for the future, China had to start somewhere.

Late in 2010, Admiral Liu Huaqing, the father of China's modern navy, passed away. Liu had sought to build China's navy first into a "green water" force and thereafter, eventually, into a "blue water" navy capable of projecting power regionally, though not globally. He insisted that he was not China's Alfred Thayer Mahan, but his concept of "Near Seas defense" was roughly comparable to Mahan's views on U.S. naval strategic requirements (i.e., dominance of the Gulf of Mexico, the Caribbean, Panama, and Hawaii). The key to the realization of Liu's vision was an aircraft carrier, and Liu reportedly vowed in 1987, "I will not die with my eyes closed if I do not see a Chinese aircraft carrier in front of me."² Admiral Liu's eyes can close now.

Much of the Asia-Pacific region, as well as the Asia-watching strategic community in the United States, is hotly debating the implications of Chinese aircraft-carrier development. Admiral Robert Willard, commander of U.S. Pacific Command, said in April 2011 that he was "not concerned" about China's first carrier going to sea, but allowed, "Based on the feedback that we received from our partners and allies in the Pacific, I think the change in perception by the region will be significant."³ Australian brigadier general John Frewen contends, "The unintended consequences of Chinese carriers pose the greatest threat to regional harmony in the decades ahead."⁴ Former director of Defense Intelligence Headquarters in the Japan Defense Agency Admiral Fumio Ota, JMSDF (Ret.), asserts, "The trials of China's first aircraft carrier . . . mark the beginning of a major transition in naval doctrine. . . . Aircraft carriers will provide Beijing with tremendous capabilities and flexibility. . . . [A] Chinese carrier could pose a serious threat to Japanese territorial integrity. . . . China's new aircraft carrier increases its tactical abilities and the chances of a strategic overreach. Other countries in the region should be worried."⁵

Yet while the Asia-Pacific region is hotly debating the implications of China's aircraft carrier, there should be little surprise that a Chinese aircraft carrier has finally set sail. Indeed, what is most surprising about China's aircraft carrier program is that it took this long to come to fruition. Given the discussions about an aircraft carrier that have percolated in China's strategic community for decades, it should have been clear to the entire region that this was a long time coming.

CHINA'S LONG MARCH TO A CARRIER

It has been a long, winding road to ex-*Varyag*'s sea trials. For decades, the story of Chinese aircraft-carrier development was one of repeated rejection. In 1928, the

commander of China's British-trained navy, Chen Shaokuan, submitted a proposal that an aircraft carrier be obtained to the Guomindang government, which rejected it the following year. Through 1945 Chen made two more detailed requests, but wartime conditions thwarted them. After the founding of the People's Republic of China (PRC) in 1949, Premier Zhou Enlai and the first commander of the People's Liberation Army Navy (PLAN), Xiao Jinguang, supported aircraft carrier development; Mao Zedong himself declared in 1958 that China needed carriers.⁶ These efforts too were fruitless—China had finally consolidated control over its continental landmass but could not hope to project naval power into American- and Soviet-dominated waters just off its coast, particularly as Maoist excesses convulsed the nation from within.

Since then, Chinese aircraft-carrier development has been shrouded in internal indecision and external obfuscation. "China will never build an aircraft carrier," a senior Beijing official told a group of foreign visitors in 1971. "Aircraft carriers are tools of imperialism, and they're like sitting ducks waiting to be shot."⁷ Yet even as Beijing was officially denying categorically that it would engage in aircraft carrier construction, Liu Huaqing, then deputy chief of staff of the PLAN, was already examining this very possibility (see the sidebar).⁸ "As early as 1970 when I worked in the Office of the Leading Group for the Shipbuilding Industry," he would recall in his memoirs, "I organized a special feasibility study for building aircraft carriers as instructed by the higher authorities and submitted a project proposal to them."⁹

A former PLAN official has confirmed to one of the authors that his service was by that time already thinking about aircraft carriers. Before the Sino-Soviet split of 1960 and, because of technological and doctrinal inertia, for some time beyond that, he explained, the PLAN copied developments in the Soviet navy, because it purchased weapons systems from the Soviet Union. Following the Sino-Soviet split in the early 1960s, the People's Liberation Army (PLA) as a whole—forced to reconsider how it acquired military equipment—realized that it would have to rely on indigenous resources and innovation.

Unfortunately for PLAN leaders, however, China at that time was in the throes of the Cultural Revolution and had turned its back on the outside world. Its military was focused primarily on preserving internal stability and administering the last vestiges of a ravaged state system. The PLA's culture, like that of its civilian leadership, was overwhelmingly ground-centric, informed by experiences in the Chinese civil war and the Korean War. China was a traditional continental power; PLA leaders were groomed within the ground forces and looked down on their counterparts in the PLA's much smaller naval and air force components. Indeed, as late as the mid-1990s the PLAN was commanded by "generals," not "admirals."¹⁰ Thus, the PLAN's operations were constrained to littoral (*yanhai*, 沿海)

Continued on page 7

CHINA CARRIER DEVELOPMENT TIME LINE

- 1928 China's British-trained navy commander Chen Shaokuan submits China's first aircraft carrier proposal to the Guomindang government, which rejects it the following year. Chen's two subsequent requests through 1945 are likewise rejected.
- Post-1949 Premier Zhou Enlai and first PLAN commander Xiao Jinguang support aircraft carrier development, but conditions do not permit it.
- 1958 Chairman Mao Zedong declares at a 21 June CMC meeting that China needs "railways on the sea" of merchantmen escorted by aircraft carriers. Proposal dies due to a lack of funds.
- 1960 Sino-Soviet split. Reduces Soviet influence on Chinese naval development but also hinders it.
- 1970 As PLAN deputy chief of staff, Liu Huaqing organizes carrier feasibility study per higher authorities' instructions; financial constraints preclude implementation.
- Late 1970s Chairman Hua Guofeng expresses support for plans to import or jointly build an eighteen-thousand-ton STOVL carrier. Project founders when China feels that British suppliers are asking too high a price.
- 1978 Deng Xiaoping consolidates power, unleashes economic reforms that will greatly expand China's overseas and maritime interests.
- 1982–88 Adm. Liu Huaqing advocates for aircraft carrier construction during his term as PLAN chief, but political and financial support prove insufficient. Commissions PLAN Equipment Department to conduct a carrier development feasibility study, which concludes funding insufficient.
- 1985 China purchases former Australian carrier HMAS *Melbourne*.
- 1992–97 Adm. Liu continues to champion the establishment of a carrier program during his time as CMC vice chairman, but President Jiang Zemin, who chairs the CMC, disagrees because he fears carrier development will disturb the United States and China's neighbors.
- 1995 Beijing reportedly interested in purchasing *Clemenceau* from France.
- 1995–96 Taiwan Strait crisis underscores volatility of Taiwan's status, motivates Beijing to devote additional resources to PLAN antiaccess capabilities, further delays aircraft carrier prioritization.
- 1995–96 Having built Thailand's *Chakri Naruebet*, Spain's Empresa Nacional Bazán reportedly attempts to market its SAC-200 and -220 light CATOBAR designs, but apparently Beijing prefers design plans to a prebuilt carrier; no deal is reached.
- 1998 China purchases the former Soviet aircraft carrier *Minsk* from a South Korean firm.
- 1998 Chong Lot Travel Agency purchases incomplete *Varyag* carrier hull from Ukraine for U.S.\$20 million.
- 2000 China purchases the former Soviet carrier *Kiev* from Ukraine. It eventually becomes a tourist attraction at Tianjin Binhai Aircraft Carrier Theme Park.
- 2001 *Varyag* hull is towed to China, and arrives in 2002 after complex, costly voyage through Bosphorus, out the Strait of Gibraltar, and around southern Africa and through the Strait of Malacca.

2004	President Hu Jintao becomes CMC chairman; supports greater PLAN role, larger regional and global presence. At expanded CMC conference on 24 December, Hu introduces new military policy that defines PLA's four "new historic missions." Hu also later endorses a PLAN Far Seas operations concept entailing some increase in power-projection capabilities.
2004	China reportedly obtains an unlicensed copy of a Su-33 carrier aircraft from Ukraine.
2004–2005	U.S., Indian, and Japanese response to Indian Ocean tsunami demonstrates value of deck aviation assets (e.g., USS <i>Abraham Lincoln</i> carrier strike group) to humanitarian assistance and disaster relief; underscores Chinese inability to contribute in this area.
2005	First photos of <i>Varyag</i> in dry dock at Dalian shipyard.
2006	Press reports of impending Su-33 contract between Russia and China (never finalized).
2007	At a media briefing during the annual National People's Congress, a PLA lieutenant general tells reporters that China's aircraft carrier program is proceeding smoothly.
2009	First photos of J-15 prototype and Z-8 AEW prototype appear on Internet.
2010	Photos appear in late 2010 showing steam emanating from <i>Varyag</i> , suggesting that its main power plant is being tested.
2011	PLA chief of staff General Chen Bingde confirms that China is developing indigenous carriers. Ex- <i>Varyag</i> begins sea trials on 10 August.

Sources: Li and Weuve, "China's Aircraft Carrier Ambitions"; Reuters, *New York Times* (various articles); Chinese Internet (various sites); GlobalSecurity.org (various pages).

and coastal (*jin'an*, 近岸) areas. There was no development of aircraft carriers for a long time, as a result of the lack of priority given to their perceived purpose and to naval forces generally.

In the late 1970s Deng Xiaoping, chairman of the Communist Party's Central Advisory Commission and de facto leader of the PRC, launched a program of "reform and opening up," which had the effect of exposing China to the outside world and linking its rejuvenating economy to the global economy through exports, imports, and investment. China's national interests were no longer restricted to its 960 million square kilometers of claimed territory and surrounding territorial waters, but increasingly extended to foreign markets and resources. It is within this context that Admiral Liu Huaqing, as PLAN commander (1982–88), began thinking beyond coastal defense and called for a more expansive Near Seas defense strategy.

The "Near Seas" concept encompasses the Bohai Gulf, the Yellow Sea, the East China Sea, and the South China Sea (of which China claims the vast majority), as well as islands in all three seas. The Near Seas are thus seen as constituting a kind of naval defensive perimeter, one that both protects China's commercial fleet and

defends the mainland (especially the economically vital coastal areas) from foreign invasion. Therefore, the Near Seas are seen by Beijing as closely related to China's national interests. Yet China's maritime interests do not stop in the Near Seas but are increasingly seen as extending far beyond China's long coastline. As Rear Admiral Zhang Zhaozhang elaborated in April 2009, "In order to defend the security of the national territory, marine territories, and the waters within the First Island Chain, [China's] proactive defense strategy does not mean that our navy only stays within the First Island Chain. Only when the Chinese navy goes beyond the First Island Chain will China be able to expand its strategic depth of security for its marine territories."¹¹ The map depicts these features.

Admiral Liu considered the aircraft carrier question within this strategic context and put forward a concept based on the proposition that, given the geographic expansion of Chinese interests and naval requirements, the security of China's fleet could not be guaranteed by land-based aircraft alone. At Liu's direction, the PLAN Equipment Department researched the technological and resource demands of producing an aircraft carrier. This study concluded that the scope and complexity of the project, involving not only aircraft carriers but their support ships and aircraft as well, would pose a daunting challenge for China's still-nascent defense-industrial complex. It reviewed the following considerations:

- An aircraft carrier had first to meet PLAN requirements.
- China's science and technology levels would have to overcome serious developmental problems.
- China would have to achieve the capability to produce all the relevant vessels and aircraft.
- The PLAN would have to marshal the requisite resources necessary to produce the carrier.

Ultimately, the study concluded, the PLAN had great need for an aircraft carrier but funding was insufficient. The PLA budget suffered negative growth during this period; there was not enough money to build destroyers, let alone a carrier. But PLAN experts felt that their work was not in vain, as they had gained a much greater understanding of vital naval systems. They believed that the navy would ultimately build an aircraft carrier, but not for the time being. Prior to 1989, the PLA purchased limited amounts of equipment from the United States; after 1989 the PLAN purchased naval vessels from Russia (and systems from Ukraine), but aircraft carriers never came into play.

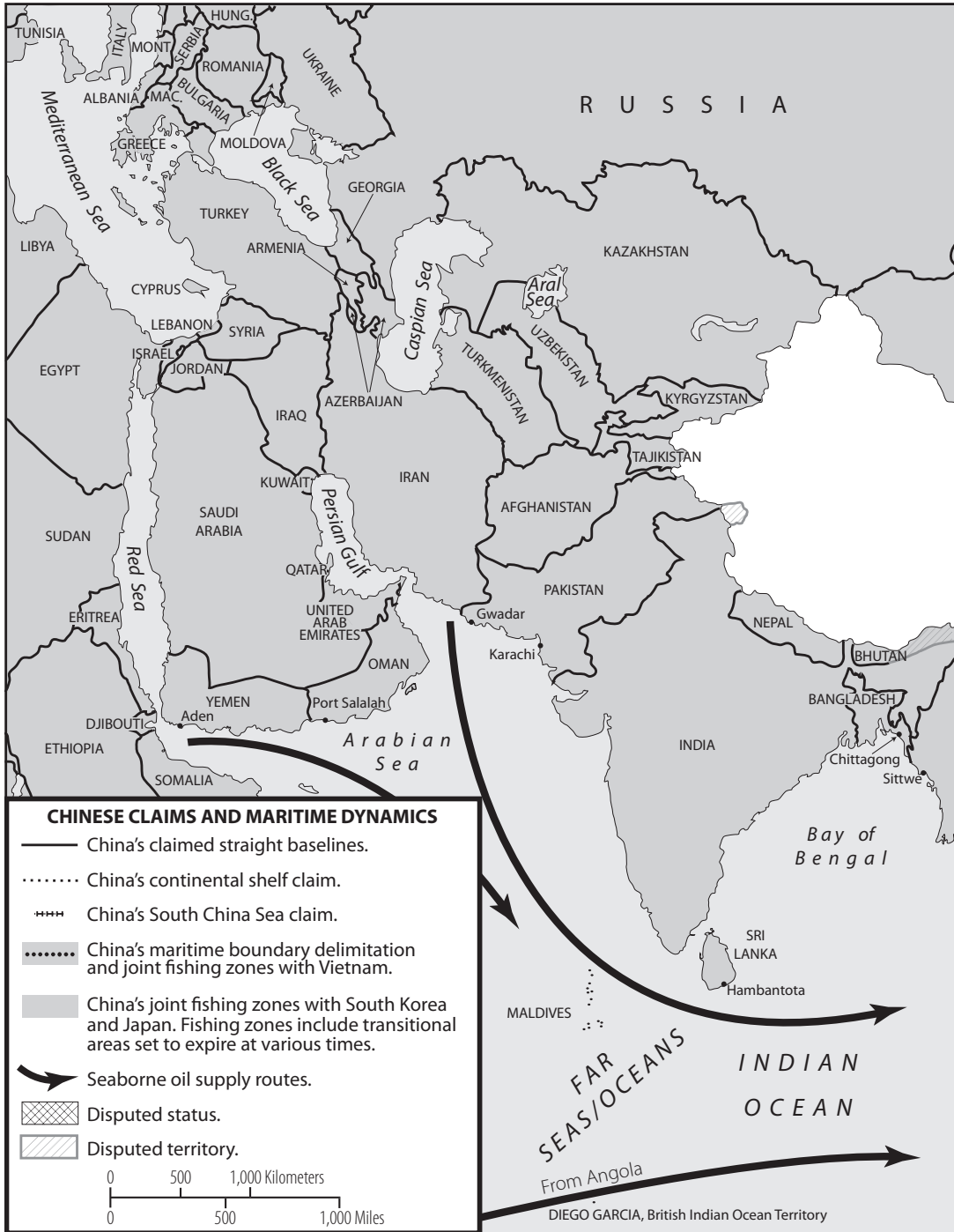
Calculations began to change after the turn of the century. China's economy had expanded sharply, as had its national interests in the outside world. Around 2000 the PLAN resumed consideration of an aircraft carrier program. Its experts

recognized that issues of complexity remained, but felt that China's newfound wealth and the concomitant rise in its external interests and international prestige called for a renewed effort. As the former PLAN official emphasized to one of the authors, "An aircraft carrier is a very complex weapons system, and demonstrates overall national strength. China is the only permanent member of the UN Security Council without an aircraft carrier; even Third World nations have aircraft carriers. The PLAN will build an aircraft carrier to fulfill a national task: to safeguard territorial sovereignty and national interests." Senior Captain Li Jie, a well-known analyst at the Naval Research Institute, the PLAN's strategic think tank, seconded this view: "No great power that has become a strong power has achieved this without developing carriers."¹²

In 2004 the president of the PRC and general secretary of the Chinese Communist Party, Hu Jintao, having recently become chairman of the Central Military Commission (CMC) as well, supported a larger regional and global presence for the PLAN. At an expanded CMC conference on 24 December 2004, Hu introduced new military policy that defined four "new historic missions" for the PLA: first, to serve as an "important source of strength" for the Chinese Communist Party (CCP) to "consolidate its ruling position"; second, to "provide a solid security guarantee for sustaining the important period of strategic opportunity for national development"; third, to "provide a strong strategic support for safeguarding national interests"; and fourth, to "play an important role in maintaining world peace and promoting common development."¹³ Hu has since endorsed a PLAN "Far Seas" operations (远海作战) concept entailing some increase in power-projection capabilities.¹⁴ The Far Seas, as employed in PLA theory, extend to the approaches to the Second Island Chain and beyond. Operating therein entails projecting power over a thousand nautical miles and more from China's territorial waters.¹⁵ (See the map for a graphical depiction of these areas.)

Beijing's long march toward aircraft carrier status began in earnest in 1998, when China's Chong Lot Travel Agency purchased from Ukraine the unfinished hull of the former Soviet carrier *Varyag* for U.S.\$20 million, initially claiming the hull would be used as a casino.¹⁶ Three years later the hull was towed through the Bosphorus, out the Strait of Gibraltar, around southern Africa, and through the Malacca Strait to its new home in northeast China. There ex-*Varyag* was outfitted, slowly but deliberately, not with slot machines or blackjack tables but with engines, radars, and weapons. There would be no gambling with this strategic opportunity.

Ten years after gliding ignominiously into Dalian harbor, ex-*Varyag* has left it again, reborn as a symbol of China as a rising naval power on the world scene. According to a PLAN officer with whom one of the authors has spoken, the ship will undergo sea trials for roughly a year and become fully operational no later





than 2015. But questions remain. What are the new carrier's capabilities? How will China use its new carrier?

INTRODUCING CHINA'S STARTER CARRIER

Ex-*Varyag* is currently undergoing a series of predelivery tests and modifications by Dalian Naval Shipyard and the Chinese defense industry, including trials in a rectangular area off Dalian, within China's territorial waters. This has been an incremental process. First, under PLAN supervision, the shipyard checked all major systems and equipment (main propulsion, auxiliary, damage control, deck, electrical, interior environmental safety protection, navigation, and spares) to ensure that the carrier's hardware met contract requirements for sea trials. Testing of the engines, for instance, explained the appearance of smoke at the pier. Then, several days before the first sea trials, design and construction teams continued to work while PLAN personnel rehearsed the task of getting the ship under way as realistically as possible and made preparations.¹⁷

The PLAN is apparently satisfied now with the quality of the ship's refurbishment; China's defense industry and its oversight organizations have been restructured to address previous concerns about inadequacies in development and production of military systems. Following completion of the test and trial program, there will be a ceremony to name the vessel, and it will be commissioned and accepted into PLAN service. The crew members can then leave the auxiliary vessel (hull number 88), currently being used to house them and to serve as a base for their training, and take up residence on board the carrier itself.

Training

The carrier's series of sea trials are being conducted close to home in order both to make the vessel a bit less accessible to prying eyes (and unauthorized digital cameras), and to keep it near home port should mechanical problems materialize. For the next several years, the focus will be on testing equipment and getting the crew used to operating such a large ship and then, having achieved some proficiency in these basic skills, on flight testing and training. Key questions that may arise in the course of future sea trials include:

- How reliable is the vessel's propulsion system? The ship's main propulsion plant is the highest-probability risk factor for complications during trials.
- When will PLAN Aviation attempt to land aircraft on the ship at sea? Will China use its top J-15 pilot to achieve a landing for a quick publicity coup? Intermediate possibilities include helicopter operations (which could be facilitated by the availability of helicopter pilots with shipborne operating experience, courtesy of the Gulf of Aden antipiracy mission), or, in the case of fixed-wing aircraft, "touch and go" approaches.

Aircraft operations are of course the fundamental reason for having a carrier capability, but actual landings of fixed-wing aircraft (deck-handling practice and even takeoffs, by aircraft lifted on board by crane from a pier, represent a lower hurdle) will likely be accomplished gradually.¹⁸ This process could be protracted, particularly if initial, modest efforts run into problems. However, in determining possible operational-capability trajectories, one must consider China's deck aviation options broadly, taking into account particularly the experience of destroyers and frigates in the nine task forces sent to the Gulf of Aden to date. What is certain is that for any nation, mastering carrier operations requires mastering a complex system of systems that includes research and development, supply and logistics, training, combat air operations, maintenance, and personnel and facilities management.

Capabilities. While ex-*Varyag*'s capabilities clearly represent a "work in progress," it is not just a "training carrier" per se, as USS *Lexington* (AVT 16) was in the last decades of its storied career. Its hardware does not need to be upgraded radically for operational service; it already possesses a Dragon Eye phased-array radar, a new point-defense missile system, and a new close-in weapon system. The Dragon Eye can reportedly track up to a hundred targets while engaging fifty simultaneously, detect targets out to sixty-five nautical miles (120 kilometers), and track targets out to 48.6 nautical miles (ninety kilometers).¹⁹ Together, no matter how it is portrayed officially, these factors make it more than a training ship and rather a modestly capable warship.

Trajectory. China's defense-industrial base, which has long favored pragmatic incrementalism, not surprisingly has adopted a "crawl, walk, run" approach to carrier development. By this logic, the first domestic aircraft carrier hull, already reportedly under construction (and perhaps others as well), will closely resemble the Russian *Kuznetsov* class (of which *Varyag* was originally a member), albeit with largely internal improvements that are invisible to casual observers. This would be not wholesale copying but emulation and incremental improvement.

According to the U.S. Department of Defense, "the PLA Navy will likely build several additional carriers in Chinese shipyards." Specifically, "construction of China's first indigenous carrier, which would likely have a . . . displacement and design [similar to those] of the [ex-*Varyag*], could begin as early as 2011. If China commences construction in 2011, the PLA Navy could have its first indigenous carrier achieving operational capability as early as 2015."²⁰ The nature of China's second domestic aircraft-carrier hull should offer a good indicator of where its program is headed overall: Will it suggest the breaking of new ground, a branching out, or a continuation of incremental improvements on a basic design?

Equipment. Not enough is known publicly about the original machinery or the ship's condition when the Chinese obtained it to make detailed judgments. But given China's strong and growing shipbuilding capabilities and the ultimate use of ex-*Varyag* as China's first aircraft carrier, it seems doubtful that anything was too problematic for Chinese technicians to work with effectively. Moreover, it seems unlikely that China would put so much work into ex-*Varyag* if the hull were fundamentally unsound. The engineering plant is now likely complete and fairly robust, although without firsthand accounts such conclusions are highly speculative. Any secondary systems associated with flight operations not yet installed should come shortly.

China's growing proficiency in building massive ore carriers and oil tankers suggests that Chinese yards can fabricate hulls up to supercarrier size. It is also very likely that China's burgeoning steel industry will be able to produce plating of sufficiently high quality to build carriers (in contrast to India, which has struggled to produce domestically high-quality steel for its indigenous carrier programs). As an example of the Chinese shipbuilding industry's rising ability to procure and assemble vessels from quality materials, the Japanese shipowner MOL has ordered four large liquefied-natural-gas (LNG) carriers from the Hudong-Zhonghua shipyard for delivery between 2014 and 2016.²¹ MOL's order is the first Japanese purchase of LNG carriers from a Chinese shipyard, but the vessels will be co-operated by Chinese firms and used to haul LNG from Papua New Guinea to terminals in China.²² The yard has already delivered five LNG carriers and had a sixth vessel under construction as of December 2010, scheduled for delivery in 2012.²³ Public sources currently do not say whether more LNG carriers are under construction in Chinese yards. However, the ability to fashion a carrier's hull has little bearing on capacity to build and integrate its systems, fittings, and machinery and then turn it into a floating air base that carries planes, fuel, munitions, catapults, and at least several hundred personnel. Perfecting the internal components of this immensely complex vessel and then learning to operate it as part of a battle group will likely require many years of trial and error, a process that cannot draw directly on China's growing shipyard capacity. It is also, however, a venture that will help China develop its defense shipbuilding industry more comprehensively, a concept supported by Li Jie, who notes that a carrier construction program benefits "the entire development of a nation's naval forces; with carriers, in fact all naval arms armament is led forward in systematized fashion."²⁴

Aircraft. News reports, as well as the former PLAN official, have confirmed that China has purchased from Ukraine the Su-27K carrier-capable fighter and that the indigenously produced J-15 Flying Shark fighter is based on the carrier-capable Sukhoi Su-33. In its latest report on China's military, the Defense Department states that the J-15 "is reportedly an unlicensed copy of a Russian Su-33,

which China obtained from Ukraine in 2004.”²⁵ Press reports indicate that the Su-33 was nonflyable;²⁶ China likely exploited this airframe extensively and applied to it the improved radar and avionics that it employs on the J-11B, the indigenous version of the Su-27. The J-15 is currently undergoing flight testing.²⁷

China currently possesses a small number of carrier-capable fighter prototypes, and Chinese media report that the PLAN has begun to train a first generation of naval aviators, presumably using runways on land. Additionally, at least one prototype *Shanying* (Mountain Eagle) JT-9 trainer exists with a tailhook (to engage flight-deck arresting gear). This aircraft is different from the grey-painted *Jiaolianji* (training aircraft) JJ-7B trainers currently in service with the PLAN’s 7th Air Division. The land-based JJ-7B is equipped with ventral fins but no hook and is thus equipped for land basing only; the prototype JT-9 version, with a tailhook and no ventral fins, suggests plans to field a carrier-capable trainer. The JJ-7B has an export designator, Fighter Trainer China (FTC)–2000, although none have been purchased by foreign militaries thus far.²⁸

Personnel. Regarding aviators and “ship drivers” alike, it is first necessary to “train the trainers.” In keeping with the pattern observed in helicopter operations by initial Gulf of Aden counterpiracy task forces, China’s first batch of carrier pilots will almost certainly be experienced “high-powered sticks,” not “nuggets” fresh out of the flight school. When ex-*Varyag* first deploys with a contingent of (presumably) J-15s, perhaps about ten, all pilots will likely be commanders, captains, or senior captains. Likewise, particularly senior and distinguished officers will probably command both ex-*Varyag* and the first domestically built carrier and fill key billets in the programmatic aspects of China’s carrier program. Bai Yaoping, one of the nine graduates of China’s first aviator/ship commander class, has been listed among the top choices to command the country’s first carrier. Currently the assistant commandant of the Dalian Naval Academy, Bai reportedly has “specially handled the aircraft carrier command personnel and combat service personnel’s training.” Perhaps even more likely to be selected for this demanding responsibility is Bai’s classmate Li Xiaoyan. Hailed as a “celebrity captain” for his distinguished career, Li served in a South Sea Fleet destroyer division as executive-officer-in-training of *Nanning* and executive officer of *Nanchang*. He also served as captain of escort vessel *Jiangmen* and the destroyer *Shenzhen*. In 2000, while *Shenzhen*’s captain-in-training, Li “and his comrades in arms set records for the first navigation across the . . . Pacific Ocean, the Indian Ocean, and the Atlantic Ocean, the first crossing of the Indian Ocean, and the first time going around the Cape of Good Hope in a Chinese navy ship formation. In 2007, when he led the ship’s participation in multi-country maritime exercises, Li’s position was chief of staff of a certain South Sea Fleet destroyer division.”²⁹

In May 1987, with CMC approval, China convened its first, and to date only, class of “aircraft pilot vessel captains.”³⁰ A rigorous process selected, from nearly a thousand naval aviators, ten for a course of three and a half years at the Guangzhou Naval Arms Command College. The nine students who passed the course were awarded undergraduate degrees with specializations in vessel command in 1990. Subsequently assigned to destroyers and frigates, they reportedly represent the “backbone” of China’s carrier program. These elite graduates typically hold the rank of senior captain or rear admiral today, suggesting that the first genera-

China’s starter carrier will confer prestige on a rising great power, help the Chinese military master basic procedures, and project a bit of power—perhaps especially against the smaller neighbors on the periphery of the South China Sea.

tion of Chinese carrier commanders will probably hold higher ranks than their American counterparts. The “top-heavy” leadership structure of initial Chinese carrier operations (to maximize the exposure of relevant personnel to them) will likely confuse

foreign observers.³¹ A weekly journal affiliated with the Guangdong Provincial CCP Committee attributes to Li Jie the idea that “we cannot eliminate the possibility of the navy borrowing from the first aircraft carrier using a rotation for training captains to do a good job of preparing for the reserves of aircraft carrier command operations that go into service later on.”³²

In 2008, a second group of fifty naval aircraft students entered Dalian Naval Academy for a four-year program in “ship-borne aircraft flight specialization in automation.”³³ In the past, Dalian has not trained pilots but rather surface warfare officers, engineers, and political officers; one of the degrees it offers is in “ship-board helicopter command.”³⁴ Dalian cannot be regarded as directly comparable to Annapolis; the PLAN has a more numerous and diverse set of naval education institutions than does the U.S. Navy. But Dalian is emerging as a cradle of deck-aviation integration; no other Chinese institution of professional military education offers the appropriate size or capabilities. A program of ship navigation and command automation (managing shipboard flight operations) at Dalian is apparently followed by flight training at Huludao Naval Flight Academy. Less clear is the division of labor between Huludao (at which officer candidates and lower-level naval aviation commanding officers pursue preassignment majors in naval aerial flight, command and staff, and shipborne helicopter command), and Yantai Naval Aviation Engineering Academy (at which officer candidates major in technical subjects involving aviation engineering).³⁵ At present, naval aviator candidates receive basic college education for two and a half years at Yantai followed by a year of specialized flight training at Huludao.³⁶

Regardless of the exact specifics, the Defense Department states, “The PLA Navy has initiated a land-based program to begin training navy pilots to operate fixed-wing aircraft from an aircraft carrier. This program will probably be followed in about three years by full-scale ship-borne training aboard [ex-*Varyag*].” In addition, “China is also looking abroad for operational expertise.” Interestingly, “in May 2009, Brazilian Defense Minister Nelson Jobim announced that the Brazilian Navy would provide training to PLA Navy officers in aircraft carrier operations. However, Brazil’s limited capabilities in this area and the extensive problems associated with Brazil’s own carrier program raise some questions as to the implications of the offer.”³⁷ However they are trained, China’s first-generation carrier pilots will likely be a small, elite team handpicked to develop and showcase Chinese capabilities. It will take years for China’s carrier community to populate full-size squadrons.

Accident Risks. Despite this methodical, high-level attention to deck aviation development, accidents are highly likely: carrier aviation is a risky, costly business. A former U.S. naval aviator, Captain Robert C. “Barney” Rubel, USN (Ret.), notes that between 1949, when jets started being deployed in large numbers by the Navy, and 1988, when the combined Navy/Marine Corps accident rate was reduced to the levels already achieved by the U.S. Air Force, the naval services lost almost twelve thousand aircraft and 8,500 aircrew.³⁸ In 1954 alone, the Navy and Marines lost 776 aircraft and 535 crewmen, and carrier-based tactical aviation suffered higher proportionate losses than the naval services as a whole.³⁹ To be sure, China has resolved some of the most fundamental physical issues involved in launching and landing aircraft from small, moving airfields, but the process remains immensely difficult, and even a less aggressive carrier operator than the United States is almost certain to suffer substantial unexpected losses as it builds its operational knowledge and human capital. It remains uncertain what financial and political costs China will incur, but clearly the first Chinese carrier aviators and ship captains face steep challenges.

Ex-*Varyag* itself is smaller than American carriers (roughly sixty-five thousand tons vice a hundred thousand—see the table). Also, instead of the catapult used by American carriers to launch planes into the air, China’s new carrier features a “ski jump,” a bow ramp that helps aircraft take off. Without catapults ex-*Varyag* will likely be unable to launch the heavier aircraft needed for ground strikes, intelligence collection, or midair refueling—relegating the ship primarily to extending air cover beyond China’s shores. This largely accords with Chinese writings on the utility of carriers, which emphasize their importance in providing air cover for naval operations. The “extended air cover” role indicated by the

technical aspects of ex-*Varyag* generally conforms to Admiral Liu's conception of Near Seas defense.

Aircraft Carrier Development Options

The smaller the carrier, the less capable and efficient it is likely to be. Any nation pursuing carrier development seriously may choose among several basic types. In descending order of size, technological sophistication, and operational capacity, they are the following.

Catapult-Assisted Takeoff but Arrested Recovery (CATOBAR). Originally created by the United Kingdom but perfected by the United States, this is what the Americans and French currently use for their aircraft carriers and what the British will use on their next design. It is considered necessary for heavy aircraft capable of long range or heavy payloads. China has no such capability at this time but would likely have to acquire it to achieve the means to conduct high-intensity carrier operations. Development of catapults would be a major new undertaking for China, far more challenging than refurbishing a former Soviet carrier or making its own version of a Russian fighter. Catapults have to be extremely well designed and constructed to function effectively—in the words of one American specialist that were relayed to the authors, “99 percent is a failing grade.”⁴⁰ A carrier also needs to be able to generate tremendous energy to power catapults while steaming into the wind for flight operations.

Embarking the highly capable J-15 airframe, a future Chinese CATOBAR carrier would likely have the physical capability to launch a long-range strike package. But although the J-15 has been modified to land on a ship, its front end has not been strengthened for catapult launch (and would likely rip right off if so stressed). Whether China can develop the combat and combat-support—such as tankers and airborne early warning (AEW)—airframes and train the pilots to perform these difficult missions in a high-stress environment remains to be seen, but acquiring the ship infrastructure would be a major necessary first step.

Short Takeoff but Arrested Recovery (STOBAR). This design combines an uncatapulted, rolling takeoff, typically assisted by a ski jump, with a traditional arrested recovery system, to maximize capacity to “bring back” aircraft laden with unexpended weapons and fuel.⁴¹ This is the system the Soviet Union used in the *Kuznetsov* class and hence is where China is starting its own carrier development efforts. The STOBAR design cannot launch the heavy aircraft that a catapult-equipped ship can, making it better suited for air defense or light-loaded, short-range strike. Given the complexity of carrier operations in general, particularly long-range strike missions, it would make sense for China's initial carrier operational concepts to focus more on the air-defense mission. This consideration also suggests that China's initial intention in terms of capability is to

acquire a ship that can credibly show the flag and launch large aircraft, however lightly loaded. It further suggests that heavy strike missions are not a major priority in the PLAN's initial carrier program.

Short Takeoff/Vertical Landing (STOVL). This design uses a rolling takeoff—again, often assisted by a ski-jump ramp—but brings aircraft back on board vertically. This is the system Spain and the United Kingdom have used on their most recent designs (though the British are moving back to CATOBAR). As a general rule, and speaking theoretically, aircraft capable of vertical landing can also take off vertically, but the performance penalty for doing so is high; load and range are far less than can be achieved with even rolling, ski jump–assisted takeoff. China may yet pursue this course, but only as a supplement to STOBAR and possibly CATOBAR. STOVL carriers would be excellent for supporting humanitarian and disaster-relief missions in the Asia-Pacific region or noncombatant evacuations farther away if China wished concurrently to make a show of force but in a less inflammatory way than a full-size, strike-capable STOBAR or CATOBAR carrier would represent.

The key variable to watch will be whether China develops a STOVL or vertical-takeoff aircraft like the “J-18” that is periodically mentioned in the media. A decision to devote significant resources to a STOVL carrier and aircraft program would suggest that China is more concerned about showing the flag, lower-intensity combat, and nontraditional security than it is about projecting substantial airpower far from home. Given China's rising naval budgets, its current program to build additional hulls of the seventeen-to-twenty-thousand-ton Type 071 landing platform dock (LPD), and its growing interest in nontraditional security, a Chinese STOVL carrier may well emerge in coming years. The vessel would likely resemble the U.S. *Wasp* class or new Japanese heavy helicopter destroyers (i.e., with a flat deck that would allow vertical takeoffs and landings).⁴² A key challenge, however, would be developing a STOVL aircraft and the accompanying propulsion systems. For example, Pratt & Whitney's F135 engine for the F-35 Lightning program cost roughly U.S.\$7.5 billion and suffered from delays, hinting at the technical challenges that exist even for one of the world's premier builders of military jet engines.

Vertical Takeoff and Landing (VTOL). Periodically proposed for U.S. aircraft carriers, to date this approach has been used by the United States only on amphibious assault ships. Unlike their STOVL counterparts, VTOL carriers cannot accommodate any type of fixed-wing aircraft, as they lack a ski-jump ramp at the bow and the ability to generate wind over the deck (i.e., to steam into the wind at high speed).⁴³ Beyond conduct of naval diplomacy and humanitarian operations, provision of close-in support for marines on shore, and limited convoy escort, VTOL

MAJOR TYPES OF AIRCRAFT CARRIERS

	Carrier Type	Typical Displacement (tons fully loaded) ^a	Example Vessel	Sample Aircraft	Max T/O Weight for Fixed-Wing A/C (lbs)
Capability	CATOBAR	80,000+	USS <i>Nimitz</i>	F/A-18F, E-2C, C-2	100,000 ^b
	STOBAR	67,500	<i>Varyag</i>	Su-33/J-15	~62,000 ^c
	STOVL	16,700	<i>Príncipe de Asturias</i> (Spain)	AV-8B, F-35B	~45,000
	VTOL/ Amphibious	13,950	<i>Hyuga</i> (Japan)	SH-60, AW-101 helos	~40,000

Sources: U.S. Navy, Spanish Navy, *New York Times*, Naval Air Warfare Center, IDSA, Sukhoi, Boeing, *Naval Technology*.

Notes:

- a. There are exceptions to these overall figures, but they do represent a larger pattern. Mission drives size. Some of the elements that drive toward a larger size also drive toward CATOBAR, which itself drives toward a larger size.
- b. This is TC-13 steam catapult's highest capacity, but the heaviest aircraft actually launched from a CATOBAR vessel is the A-3 Skywarrior, with a maximum takeoff (T/O) weight of 82,000 lbs.
- c. Based on maximum takeoff weight of the Su-33, per correspondence with a retired Russian naval officer. This assumes launch from either of two normal positions on the carrier *Kuznetsov* (to provide a maximum takeoff distance of 345 feet), with 70 percent of internal fuel and four air-to-air missiles (typically two R-27 and two R-73) and without external fuel tanks. By contrast, launching from a third possible position—between the third and fourth arresting wires, closer to the port side of the deck, and with no deflector (maximum T/O distance 640 feet)—would preclude simultaneous landing operations. Moreover, Major General Timur Apakidze, the father of Russian STOBAR aviation, is said to have asserted unofficially that launching from this third position is foolhardy if wind over deck is less than fifty knots, a typical constraint as *Kuznetsov*'s poorly designed and maintained steam turbines could rarely propel the ship at more than twenty-five knots, with a typical maximum speed of eighteen to twenty knots. For these reasons, as of 2001 no launches had been made even from the third position of a fully loaded Su-33 (maximum payload 14,330 lbs., takeoff weight 73,850 lbs.). The officer believes that ski-jump launch and a T/O weight limit of 62,000 pounds would present even more challenges for China than for Russia: the Su-33's main design aim was to fit *Kuznetsov*'s deck, with weapon-carrying capabilities secondary; the J-15, by contrast, has apparently been designed to possess significant air-to-surface strike capabilities.

carriers have few operational uses. China may also pursue this course, but again only as a supplement to STOBAR, and possibly CATOBAR. Given that STOVL carriers can effectively operate helicopters, as well as STOVL/VTOL aircraft like the Harrier or F-35B, with heavier loads than would be possible on VTOL ships, if China desires this capability, STOVL would make far more sense than VTOL.

CONSTRUCTION PLANS

Given the sheer scale and historic significance of this undertaking, China's reticence regarding the purposes, and even the basic fact of the construction, of an aircraft carrier has been remarkable. When General Chen Bingde, chief of staff of the PLA, finally broke Beijing's official silence on the matter in June 2011 by remarking that "[an] aircraft carrier[s] [is/are] now under construction, but not yet completed," he raised far more questions than he answered.⁴⁴ General Chen's statement might indicate an intention to develop additional carriers, but the nature of the Chinese language, combined with ex-*Varyag*'s unofficial status at the time, adds uncertainty as to his intended meaning.

In its annual public reports on China's military power, the Defense Department has since 2006 addressed the possibility that China was actively working

to acquire an aircraft carrier. In its 2011 edition, the Pentagon projected that ex-*Varyag* “will likely serve initially as a training and evaluation platform, and eventually offer a limited operational capability.”⁴⁵ The report elaborates that “the ship could become operationally available, although without aircraft, by the end of 2012. However, it will take several years for an operationally viable air group of fixed and rotary wing aircraft to achieve even a minimal level of combat capability.”⁴⁶ The report adds, “China likely will build multiple aircraft carriers with support ships over the next decade.”⁴⁷

Li Jie says ex-*Varyag* will be a viable weapons system, albeit with much less operational capability than its American peers. He acknowledges that ski-jump carriers cannot launch aircraft that are as heavy, carrying as much fuel or weaponry, or do so at the same high rates as can a CATOBAR ship.⁴⁸ In fact, Rear Admiral Yin Zhuo calls ex-*Varyag*’s use of a ski jump a “mistake” because it precludes the ability to launch AEW aircraft.⁴⁹ Accordingly, and as noted, China’s second domestic (and third operational, after ex-*Varyag*) hull is likely to offer truer indications of where China is heading with carrier design.

Here China will face a dilemma common to militaries when fielding new systems: whether to stay on schedule by limiting capabilities or to pursue more complex, higher-performance technologies, for which foreign assistance is unavailable, and thereby risk jeopardizing the schedule. It has been argued above that China will tend toward the former—that it will “crawl, walk, run”—but if so, important questions arise. First, as long as China remains focused on STOBAR carriers, how will it provide airborne early warning, given that such ships cannot launch fixed-wing AEW aircraft?

Some form of air-based capability is likely needed to support C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance) capabilities, as a sufficient radar horizon would be very difficult to obtain from a sea-based platform.⁵⁰ Unmanned aerial vehicles (UAVs) might offer supplemental capacity. In April 2011 Japanese forces reportedly spotted a small Chinese drone (roughly the same size as the fourteen-foot-long U.S. RQ-2) overflying a PLAN frigate as a Chinese strike group sailed into the western Pacific.⁵¹ But a capable air-search radar would seem too large to put on a UAV or a ski jump-capable aircraft, and (pending major advances in miniaturization from China’s defense industry) must be ship based. For the Near Seas, then, China might for some time rely on land-based AEW and airborne-warning-and-control-system aircraft to support operations. This would likely necessitate interservice coordination, which has become a major PLA objective. For the time being, however, PLAN officials worry that their programmatic goals might be undermined; it is too early to tell how this complex operational sociology might play out.⁵² As

long as China is limited to STOBAR carriers, its deck-aviation air and surface pictures will be restricted by time on station or radar horizon.

Helicopters would appear to be the most obvious near-term approach, although they offer only limited capability. A U.S. E-2 Hawkeye aircraft enjoys a two-hundred-nautical-mile radar horizon at a twenty-five-thousand-foot elevation; a helicopter would likely have a substantially reduced horizon, as it would be unlikely to operate at over eight thousand feet. A Z-8 helicopter, previously seen only in prototype colors, has recently appeared in PLAN colors on the Internet,

The journey will be long and tortuous, but China must start somewhere if it hopes to become proficient in high-intensity carrier operation.

indicating some progress. A Z-8 AEW helicopter was also photographed hovering over ex-Varyag the day it left for sea trials, possibly making China's first "carrier landing."⁵³

That, in turn, raises the critical and underappreciated question of when China will build more helicopters. It currently lacks sufficient numbers to outfit its new frigates and destroyers or the aircraft carriers that it is starting to build now, let alone helicopter carriers and other types that it might add in time. Delays to date suggest that the PLAN is so dissatisfied with existing helicopters that it is willing to take risks in this area. The Z-8 has engine problems and is too large to embark on destroyers and frigates (it has participated in only one Gulf of Aden deployment, during which it operated from the Type 071 *Yuzhao*-class LPD *Kunlunshan*, hull 998). The Z-9 is too small and lacks both range and capacity. The Ka-27 and Ka-31 Helixes are imported from Russia, incurring a form of dependence that China does not want to sustain over the long term. The PLAN appears to be awaiting delivery of the Z-15, a Chinese version of the Eurocopter EC-175; a civilian variant is currently in testing. China's pursuit of two major AEW helicopter programs (the Z-8 and the Ka-31) simultaneously is further evidence that its first indigenous carrier will be a STOBAR design similar to ex-Varyag;⁵⁴ if moving straight to a carrier with catapults, China could save significant effort by importing Ka-31s from Russia. It has already acquired some (the late 2009 contract was for nine), and the first Internet photos appeared in late 2010.⁵⁵

More broadly, how much will China invest in aircraft suitable for STOBAR—a considerable sunk cost with path-dependent aspects—before it considers moving to CATOBAR?⁵⁶ To make such a transition, it would at a minimum have to perfect catapults and modify fighters significantly. An April 2011 article in *Liberation Army Daily* discusses the importance of strengthening aircraft landing gear, improving anticorrosion measures, and ensuring that aircraft can fold wings and otherwise minimize the space they take up.⁵⁷

Another key question is whether China will ultimately consider nuclear propulsion for larger future carriers. Space and acoustic challenges are not as pressing for them as they are for submarines, but the demands of nuclear-powered carriers can still preoccupy even formidable navies. The United States managed years of global deployments with conventionally powered carriers, albeit in an era of low fossil-fuel prices unlikely to be seen again.⁵⁸ For their part, fossil fuel-powered carriers have disadvantages vis-à-vis nuclear power, including lower limits on aviation fuel-carrying capacity. These are well chronicled by Chinese naval analysts. Rear Admiral Yin Zhuo, for one, believes that ex-*Varyag*'s use of "heavy" fuel oil is a major strategic mistake in the ship's design, pointing out that

it takes longer for the carrier to restock heavy oil, because its fuel stores are approximately 4,000 to 5,000 metric tons. . . . One can imagine that for this amount of fuel, pressurization alone would take several hours. Moreover, other vessels need to take on diesel or kerosene, because they are driven by gas turbines. The replenishment has to be done through different lines, making underway replenishment as a whole very complicated. If a vessel next to you is being replenished, you cannot launch any weapon, because the fuel vapor released is highly explosive and flammable, and safety is at risk. As a result, the combat effectiveness of the entire formation will be affected. Replenishment for a whole formation takes at least eight to twelve hours. During this twelve-hour period, the formation has no operational capability. For a conventional combat capacity of this size, it is a mistake at the decision-making level.⁵⁹

To be sure, even nuclear-powered carriers are dependent on conventionally powered escorts and aircraft, although the U.S. Navy is researching alternative fuels for even these platforms.

IMPLICATIONS FOR CHINA

In itself, the advent of a relatively small and underperforming aircraft carrier is of limited military significance. A single carrier will of necessity spend much of its time in port for maintenance, thus depriving its navy of any airpower-projection capability at all. Even while under way, ex-*Varyag* will require a coterie of escort and logistics ships for support and protection. Yet that protection would likely be insufficient in a conflict with the United States. Given the U.S. military's adeptness at long-range precision strike, the question would be not whether ex-*Varyag* would survive the war but whether it would survive the first day.

This is not to say that ex-*Varyag* will have no military utility for China. Indeed, the remarkable rapprochement enjoyed between the PRC and Taiwan since the 2008 election of Ma Ying-jeou as Taiwan's president has decreased Beijing's concern about Taiwan independence. Meanwhile, China's contested claims of sovereignty over almost the entire South China Sea, like China's increasing

entanglement with foreign resources and markets, have begun to shift the PLA's defense interests toward what the U.S. Office of Naval Intelligence terms "new but limited requirements for protection of the sea lanes beyond China's own waters, humanitarian assistance/disaster relief, and expanded naval diplomacy."⁶⁰

Farther afield, then, in the western Pacific and the Indian Ocean, China has not developed high-intensity military capabilities, instead projecting influence in the form of peacetime deployments.⁶¹ It is in connection with this more distant, lower-intensity effort that China is likely developing its naval aviation. The validity of that strategic assessment would be bolstered by China's indigenous development of additional, potentially larger and more capable, carriers (see below). Thus, it is incumbent to look beyond the significant limitations of ex-*Varyag* and consider the implications for China of a more robust and capable naval aviation arm.

Potential Missions

Chinese aircraft carriers could conceivably fulfill or contribute to a wide variety of missions. The former PLAN official previously quoted has argued that aircraft carriers in general will continue to constitute a central element of world naval operations for the foreseeable future. Part of this conviction likely stems from the PLAN's growing realization that nontraditional security missions—disaster relief or counterpiracy—account for the bulk of likely military contingencies and that aircraft carriers greatly aid responses to them. In addition, even a rudimentary naval aviation capability would enhance China's negotiating leverage in its various maritime disputes. While the number and capabilities of China's aircraft carriers will to some extent determine the missions they undertake, the decisive factor will likely be a political determination in Beijing as to how to use China's expanding naval power. In the order in which they are likely to be considered, beyond training and naval diplomacy, such missions include the following.

Asserting Maritime Claims in the South China Sea. Even a single carrier could extend the reach of China's airpower significantly and could be decisive against the smaller and less capable navies of Southeast Asia. Liu Huaqing envisioned the maintenance of China's claims in the South China Sea as a primary carrier mission. This task is certainly one in which a carrier flying modern strike fighters like the J-15 would have a much greater military and diplomatic impact than amphibious assault ships or helicopter carriers alone. Indeed, Liu worried that amphibious vessels did not provide adequate air cover and argued that carriers could fill this void.⁶² According to both the 2000 and 2006 editions of *Science of Campaigns*, an authoritative volume written by scholars at China's National Defense University, carriers can play a crucial role by providing air cover beyond the range of land-based air to support long-range landing operations against small islands, such as in the South China Sea: "Combat in the deep-sea island

and reef region is relatively more independent, without support from the land-based force and air force. Under this situation, an aircraft carrier is even more important in winning victory in the campaign.”⁶³ In November 2008 and June 2009 the amphibious assault ship *Kunlunshan*, together with destroyers, frigates, and supply ships, conducted long-distance patrols of the disputed waters in the Spratly Islands; PLAN marines executed at least one island-seizure exercise.⁶⁴ As one Chinese expert states, “Our carrier will definitely not engage with powerful U.S. aircraft carrier fighting groups. But it is enough to be a symbolic threat among neighboring countries like Vietnam, Indonesia, and the Philippines who have territorial disputes with China.”⁶⁵ Most recently, a senior *Liberation Army Daily* reporter, Senior Colonel Guo Jianyue, PLA, wrote on a news website run by China’s Ministry of National Defense and affiliated with his employer, “Why did we build it if we don’t have the courage and willingness to use the aircraft carrier to handle territorial disputes?”⁶⁶

Chinese carrier deployments into the South China Sea are therefore likely to be seen as threatening by neighboring countries like Vietnam and the Philippines, which assert competing territorial and maritime claims. Unable to match China’s land- or sea-based airpower, they are now seeking ways to protect themselves from what they fear will be increasing pressure from Beijing to compromise. Some of China’s neighbors, perceiving ex-*Varyag* as a confirmation of rising Chinese naval power and an erosion of the credibility of American security guarantees, may seek bilateral accommodations with China. Others may decide to deepen military-to-military engagement with the United States and enhance their own naval capabilities. For example, Hanoi’s recent decisions to expand cooperation with Washington and to purchase six Russian-built Kilo-class conventional submarines were, in part, direct responses to the potential threat posed by a Chinese aircraft carrier—as well as reflections of its loss of islands in skirmishes with China in the Paracels in 1974 and the Spratlys in 1988.

Supporting Sea-Lane Security Operations against Low-Intensity Threats. One such threat is piracy. Antipiracy missions emphasize helicopters and embarked special forces for boarding vessels but could be enhanced significantly by carrier-based, dedicated, airborne reconnaissance platforms. Carrier-borne strike fighters would also give China a credible way to deter and attack pirates, as well as any other elements that attempted to disrupt Chinese vessels in the South China Sea, the Indian Ocean, or beyond.

Humanitarian Assistance and Disaster Relief. Though it has not yet handled any disaster-relief missions abroad and may not be genuinely interested in doing so, the PLAN could reap substantial diplomatic benefits from a carrier that could support intensive helicopter operations following a disaster like the 2004 Indian

Ocean tsunami or Japan's 2011 earthquake. The United States, and to a lesser extent India and Japan, were given great credit for using deck-aviation assets for humanitarian assistance and disaster relief following the 2004 tsunami; China had no such option at the time. Such nontraditional security missions, emphasized in the Hu Jintao era as part of a set of "diversified military tasks," are regarded by many PLA experts as among the PLAN's best opportunities for training for local, limited wars under "informatized" conditions.⁶⁷

A Taiwan Contingency? Liu envisioned a cross-strait conflict scenario as a major rationale for carrier development and deftly marketed it to the PLA leadership as a cost-effective way to limit the need for new airfields.⁶⁸ Arguably, the prospect of U.S. intervention following Taiwan's democratization in the late 1980s rendered this vision obsolete and delayed Chinese carrier development. Yet despite recent cross-strait rapprochement, the PLAN remains focused primarily on enhancing regional "antiaccess/area denial" to prevent Taiwan from declaring independence and generally to defend the waters near the mainland from foreign intervention or invasion. In a Taiwan scenario, ex-*Varyag* would have no useful role east of the island—land-based aircraft can already cover the entire island, and attempts to use a single carrier of modest capabilities to deter or complicate the approach of an American naval task force would be ill-advised. South of Hainan, perhaps near the Paracels, backed up by land-based air cover, it could conceivably help protect China's southern approaches.

Establishing Sea Control in the First and Second Island Chains. Missile-centric as it is and concentrated on areas fairly close to the mainland, the PLA is still clearly sized and shaped chiefly to support China's claims on its maritime periphery, as opposed to extraregional, blue-water sea control. The PLA's current order of battle is based primarily on the world's foremost array of substrategic, land-based mobile missiles, such as the DF-21D antiship ballistic missile; on diesel submarines armed with cruise missiles, torpedoes, and sea mines; and on improved variants of surface ships and aircraft (such as the J-20, which may become China's first stealth fighter when operational, between about 2017 and 2019), outfitted with increasingly capable missiles.

Aircraft carriers could ultimately help the PLAN begin to shift its operational focus within the First and Second Island Chains from antiaccess and area denial to sea control. The primary distinction is that between the negative and the positive—whereas the former seeks to deny an adversary access to a specific area for a specific amount of time, sea control seeks to assert a navy's mastery over a given body of water in relative perpetuity. A Chinese carrier does have utility between the First and Second Island Chains but probably not in an American style. Instead, it would provide air cover to a surface group effectively enough to help get the antiship-cruise-missile "shooters" within range of the enemy.

In some cases, a Chinese carrier could thus facilitate an attack on a U.S. carrier, as suggested in a major doctrinal publication:

The naval fleet's long-range operational forces make up the important part of counterstrike operational forces. The joint anti-air raid commander, while organizing counterstrike operations, should give special attention to the use of naval forces. Particularly:

- A. Bomber and fighter-bomber airborne units can participate in airborne counterstrike operations; concretely, they can perform tasks of assaulting . . . sea-based targets.
- B. Fighter airborne units can perform vessel-guarding tasks.
- C. Naval vessel units can perform operational tasks of attacking the enemy's aircraft carriers.⁶⁹

Aircraft carriers may contribute to this strategy, by extending the range of China's heretofore land-based tactical air, long-range surveillance, anti-surface ship strike, air-defense interdiction, and early warning. Certainly additional capabilities, especially in the area of antisubmarine warfare, would also be required for this new mission, but an aircraft carrier, and especially multiple carriers, could put China on its way to achieving them. Still, China remains constrained significantly by geography and would face a very difficult, complex, protracted transition.

Extended-Range Power Projection. China's economic health and vitality is dependent on its reliable access to foreign markets and resources via maritime trade routes. The most vital of these routes run through the South China Sea and Indian Ocean, linking China to energy resources in the Middle East and Africa. Indeed, 95 percent of PRC exports to Europe, Africa, and the Middle East—and almost 100 percent of China's imports from Europe and the Middle East—flow through the Indian Ocean. Securing access to these resources and markets is therefore a top Chinese national interest, and an emerging mission for the PLAN.

Campaign Theory Study Guide, a textbook issued (like *Science of Campaigns*) by China's National Defense University, draws on a variety of high-quality doctrinal publications. To improve the protection of the nation's sea lines of communication in the Far Seas in the future, its authors hold, China should "endeavor to establish a contemporary, integrated and offensive, new, special mixed fleet with an aircraft carrier as core and missile destroyers (or cruisers) and nuclear attack submarines as backbone forces."⁷⁰

Over the long term, aircraft carriers will thus be essential to defending Chinese interests into the western Pacific and Indian Ocean. According to the former PLAN official already quoted, the future relative prioritization given by the PLAN to the Near Seas and the Indian Ocean is difficult to determine. "China will never change its defensive policy," in his view, "but the PLA must safeguard national

interests.” To this end, more than one carrier group would be required to sail regularly through these vital waterways and protect Chinese shipping.

Yet such missions are logistically taxing and operationally complex. To some extent, China’s rapidly improving constellation of space-based assets can facilitate long-distance operations without presence in other countries. But STOBAR carriers would likely be needed to provide sufficient AEW, given the lack of land-based options, and they would have to exist in sufficient numbers to ensure that other missions and refits could be accommodated. Moreover, the projection and sustainment of military power over vast distances require a robust support system that would likely include a network of military bases, or at least reliable “places” (e.g., supply depots), throughout the Indian Ocean. The development of such an infrastructure would require a dramatic shift in Chinese strategic thinking, which has long prided itself on its principles of “nonintervention” and its opposition to “hegemony,” a category in which foreign basing has long been included.⁷¹ How Beijing can adjust its force posture and traditional policies in this regard is apparently a matter of debate. There is also the question of what nations would be willing to host Chinese forces and under what conditions. Indian engagement throughout the region is extensive, and numerous other nations, such as the United States, France, Japan, Australia, and the United Kingdom, have substantial interests in the Indian Ocean as well. The fact that China has no present or prospective allies in the American sense means that it is far more geographically constrained than is generally appreciated.

Strategic Benefits

Among the likely strategic benefits for China is enhanced regional diplomatic influence. A carrier group would offer immense diplomatic payoff in visible naval presence in the South China Sea and Southeast Asia, along key sea-lanes in the Indian Ocean, and in humanitarian missions throughout the region. Simply steaming aircraft carriers anywhere in the Asia-Pacific would send a strong signal to the region that China’s power is significant. Visiting ports in the South China Sea and the Indian Ocean in particular would send a powerful political message of expanding Chinese military might.

A second potential strategic benefit is the protection, or if necessary rescue, of Chinese citizens or economic assets abroad. As Chinese businessmen spread throughout the world in pursuit of economic opportunities, they have become entangled in and endangered by instability. Safeguarding Chinese citizens has therefore become an increasingly important task for China’s government; aircraft carriers would improve China’s ability to defend its nationals and high-profile economic interests in volatile areas between the Red Sea and China’s coast.

In the future, China’s capabilities will likely be tailored specifically to handling threats to its citizens and economic interests abroad. These include such

nontraditional security threats as piracy and terrorism, as well as internal chaos in other nations, like that seen in Libya in 2011. This strategic choice would represent a contrast with the United States, whose military possesses truly global, and highly sustainable, expeditionary capabilities that enable it to fight large wars virtually anywhere in the world.

Modern carriers also offer multirole versatility, a scalable set of capabilities that can handle a range of contingencies. The platforms and operational infrastructure that make high-end missions possible can also be scaled down to deal with nontraditional security missions like disaster relief or the suppression of piracy. China's military is improving its capacity for dealing with relatively small-scale threats that do not involve potential forcible entry into a hostile area yet require long-range deployments. For example, Chinese analysts associated with Senior Captain Li Jie have noted how in 1994 the U.S. Army embarked helicopters on board USS *Dwight D. Eisenhower* (CVN 69) for transport and strike support in a peacekeeping mission in Haiti, an example that undoubtedly resonates in a country that is beginning to acquire the ability and perceive the need to conduct more noncombatant-evacuation operations in potentially hostile areas.⁷² Improved abilities to show the flag and assist in humanitarian missions and other military operations other than war can potentially allow a limited expeditionary military capacity to yield substantial diplomatic benefits. It is important, however, to understand that the PLA's naval, air, and ground capabilities for out-of-area operations are likely at least fifteen years away from the levels needed for the scalable responses to high- and low-intensity threats that the Defense Department possesses today.

Strategic Drawbacks

As Chinese analysts long insisted, aircraft carriers have their negative aspects, and the foremost of these is vulnerability—because of their size, configuration, and roles, carriers are disproportionately susceptible to attack. They arguably have not been tested in the missile age. Since World War II, the closest any carrier has come to high-intensity conflict where it faced a real threat of damage or sinking was during the 1982 Falklands War, when Exocet missiles disabled and later sank the destroyer HMS *Sheffield* and the containership SS *Atlantic Conveyor*. The British task force commander, Admiral Sandy Woodward, later acknowledged that had the carriers HMS *Hermes* or *Invincible* suffered a similar fate, the United Kingdom would have withdrawn them and likely lost the war.⁷³ Moreover, had the Argentines simply fused their bombs correctly (a number of bombs hit British ships but failed to explode, because they were improperly fused) the British might well have lost. In 1982, asked during a Senate hearing how long U.S. aircraft carriers would survive in a major war against Soviet forces, Admiral Hyman Rickover famously replied, “About two days.”⁷⁴ These facts are not lost on Chinese strategists, who have “transferred” and “reverse-engineered” history by

studying these and other conflicts for lessons and are pursuing what is arguably the world's most missile-centric approach to warfare today.

In a high-intensity confrontation against a foe with submarine, air, and surface-based antiship capabilities, the life expectancy of a Chinese carrier would probably be measured in hours. Chinese carriers will likely remain highly vulnerable for the foreseeable future, given what many see as a fundamental weakness in

As ever, the determining factor is not the weapons system itself but how it is used. As Major General Qian Lihua declared, "The question is not whether you have an aircraft carrier, but what you do with your aircraft carrier."

the PLA's antisubmarine warfare capabilities; the recent acquisition of, or expressions of interest in, submarines by Vietnam, Indonesia, and Malaysia; and the highly credible attack submarines of the U.S., Indian, Japanese, and Australian navies.

A second drawback is that carriers and their supporting ships and infrastructures are extremely expensive. This reality derives in part from the carrier's vulnerability to attack and in part from the supporting systems needed if it is to operate with maximum effectiveness. China's large and active shipbuilding infrastructure and labor base are likely to reduce its carrier construction and outfitting costs relative to those of, for example, the United States. Still, the final cost of a domestically built carrier will likely be equal to that of several Type 071 amphibious assault ships or helicopter carriers—which are very well suited for the contingencies China is most likely to face and would arouse less fear among its neighbors.

If the PLAN intends to conduct credible carrier operations in distant seas, it will need to acquire more advanced air-defense vessels and nuclear-powered attack submarines, enhance its at-sea replenishment capability, and better integrate land-based tanker aircraft and airborne warning and control with its carrier aviation. The cost of building a carrier similar to *Varyag* has been estimated at two billion dollars, the total cost of a battle group (including the carrier) at ten billion.⁷⁵ China's rising national power and defense budget (officially \$91.5 billion for 2011—the Pentagon estimates China's defense-related expenditures for 2010 at over \$160 billion) enable its navy to develop some level of deck aviation "on the side" without becoming "carrier-centric."⁷⁶ But the PLAN's personnel, equipment, and operational costs are all rising and may begin to compete with rapidly expanding nonmilitary budget priorities (e.g., infrastructure investment, social security, and other costs associated with managing a society that is rapidly urbanizing, globalizing, marketizing, informatizing, privatizing, and aging).⁷⁷

Furthermore, an operational Chinese aircraft carrier capability is likely to unnerve China's neighbors and may catalyze more formal security alignments aimed at counterbalancing China's growing military power. An aircraft carrier

is inherently a power-projection tool; even utilized in the most benign way, ex-*Varyag* will extend the range of Chinese airpower. China's neighbors and strategic competitors will likely seek to hedge against what they interpret as a signal of Beijing's desire for a robust naval capability that can shift quickly from soft- to hard-power missions. Regardless of its actual capabilities and vulnerabilities, a carrier is viewed by many as an instrument of the very "gunboat diplomacy" that Beijing decries. A Chinese carrier or carriers could in fact drive the defense spending and acquisitions of regional neighbors in a way that more deadly but less conspicuous systems like missiles and submarines do not. To the extent that China fails to derive significant strategic benefits from its carrier programs, it will suffer "the onus without the bonus."

Fourth, a carrier program yields results only slowly. The long lead time to actual operational capability of the ship itself gives potential adversaries time to build up countermeasures, which are likely to be much cheaper and available relatively quickly. Developing a robust carrier capability in the broader sense also takes time. Landing aircraft on a carrier is much more difficult than doing so on land. It took the former Soviet Union seven to ten years to make the Su-27K work well on its carriers. According to the former PLAN official quoted above, China will not need ten years, but it will need several years at least.

WHAT'S NEXT FOR CHINA'S CARRIER PROGRAM?

The former PLAN officer believes that China will eventually have three or four carrier groups, with one operating at any given time. Similarly, Li Jie says, "Ideally, there will be three or more aircraft carriers, even five or six."⁷⁸ Chinese state-connected media have speculated that China will eventually need at least three aircraft carriers in all.⁷⁹ Beijing's timetable for developing additional aircraft carriers domestically is unclear. As this article went to press, the existence of an indigenous Chinese aircraft carrier under construction remained unconfirmed.

Moreover, the ultimate number of carriers to be fielded by the PLAN is uncertain. Given the relatively limited scope of Chinese interests and obligations, the twelve of the U.S. Navy are certainly more than Beijing needs. In keeping with its usual ad hoc, pragmatic approach, China will likely make decisions regarding subsequent carriers after conducting trials and experiments with its first one (or first "batch"). A key question is, what constitutes an operational carrier? Where is the line to be drawn analytically between initial operational capability, however limited, and showy exercises for public consumption? Will the carrier become "operational" when a senior aviator with several thousand hours of flight time lands on its deck at sea? Will ex-*Varyag* become "operational" upon its initial "shakedown cruise," or "patrol," in the Near Seas outfitted with helicopters and J-15s and escorted by destroyers and oilers? China might conceivably put eight or

ten helicopters on ex-*Varyag*'s deck and send it down to the South China Sea with a few escorts far earlier than observers expect, or dispatch with a few helicopters and, say, two J-15s flown by top test pilots. Most likely, the true operational capability of China's carrier will remain ambiguous for some time, not only to foreign observers but to the PLAN itself. There is much to be learned and much to be done.

In any case, American experts should not expect China to mirror the U.S. Navy in the composition of its carrier groups. While U.S. carriers often sail with entourages of support and escort ships, a Chinese carrier may steam with a much leaner coterie.⁸⁰ Indeed, the number and type of escorts and support ships could be either significantly larger or smaller than the American model, depending on the expected operating environment and tempo. Yet there seems to be a minimal need for escort and supply ships during peacetime; the French *Charles de Gaulle* carrier was accompanied by a destroyer, a submarine, and a supply ship during an exercise with the Indian carrier *Viraat*, which was accompanied by two frigates and a submarine.⁸¹

A further potential difference is apparent in the fact that both ex-*Varyag* and Chinese destroyers possess phased-array radars, leaving uncertain which will play the general role handled in the U.S. Navy by Aegis destroyers and cruisers. China, apparently satisfied with its Luyang II (Type 052C) design, is building a substantial number of them, suggesting that it might soon possess sufficient ships for a variety of escort, detection, tracking, and missile-uplink functions. To this point, Li Jie believes that one purpose of China's Gulf of Aden antipiracy mission is to help select frigates for future carrier groups.⁸²

The issue of China's general capability to construct a carrier has been discussed above. With regard to shipyards specifically, however, it appears that the nation possesses a total of seven with berths large enough (three hundred meters or more). These yards are located in Dalian, Qingdao, Shanghai, Guangzhou, and Huludao. All are operated by either the China State Shipbuilding Corporation or the China Shipbuilding Industry Corporation, the two state-controlled giants that dominate the industry. There are other, private yards with supertanker-sized berths. However, the PLAN will most likely call on a state-owned yard to build its carriers, given the sensitivity of the project and the fact that all other major surface-combatant construction to date has been performed in state-owned yards.

Shipyards will almost certainly vie to be selected as carrier builders, due to the project's national prestige. The competition between them is unlikely to be as tightly cost based as commercial projects; experience in building military vessels and competence in systems integration will likely take precedence over price considerations. In that respect, Shanghai's Changxing Island Shipyard, Dalian, and the Bohai Shipbuilding Heavy Industry complex near Huludao (where many of

China's submarines are built) are strong candidates. Bohai has the added benefit of large, covered building sheds where carrier parts could be fabricated in modular fashion and out of the view of satellite surveillance. The company says it has the "largest indoor seven-step" ship construction facilities in China.⁸³

As for the potential configuration of indigenous carrier hulls, they are not likely to be catamarans or small-waterplane-area twin hulls, as artists' impressions currently being circulated around the Chinese Internet suggest. The reasons are fairly straightforward (aside from developmental risk aversion already discussed): while a multiple-hull design handles well at sea, it has a much lower hull volume than a monohull of comparable length and overall beam and correspondingly less space for fuel, weapons, aircraft, and propulsion systems. Also, a wave-piercing design may produce a very wet deck, creating corrosion and problems for aircraft operations and the safety of equipment and personnel on deck in heavy seas. Moreover, the radar cross section of such a configuration would be enormous.

IMPLICATIONS FOR THE UNITED STATES

Militarily, a single Chinese aircraft carrier is of minimal significance to America. Ex-*Varyag*'s emerging capabilities will simply be too modest to challenge U.S. power projection in East Asia. Unlike China's robust, burgeoning missile, submarine, and sea-mine capabilities, it has no useful role in high-intensity major combat operations and will not for the foreseeable future. U.S. proficiency at long-range precision strike and submarine warfare make a single aircraft carrier highly vulnerable during wartime. Further, regular maintenance requirements mean a considerable amount of time in port.

Politically, however, even a single Chinese aircraft carrier could have significant implications for American interests in East Asia. The message to the region implicit in the sailing of a Chinese aircraft carrier—the existence of a rising China with increasingly capable naval power—will demand a still-more-compelling response from the United States. Regional leaders are nervous at the prospect of an overbearing or coercive China enabled by a strong naval presence and are looking to the United States as a hedge to preserve their independence of action. For America's allies, this has meant increasingly close cooperation on military issues. Moreover, several other states in the region, especially in Southeast Asia, have in recent years reached out to the United States as well, concerned about Chinese assertiveness. Chinese aircraft carrier development is already casting its first and largest strategic shadow in the South China Sea.

Yet American strategists must begin to plan for the near-inevitability of a PLAN equipped with multiple carriers, most of which will be far more advanced technologically than the starter ship. Complicating American planning, however,

is a remarkable degree of uncertainty surrounding Beijing's intended uses of its future carriers. Indeed, they could be either important bulwarks of international stability or fundamental challenges to American military presence in the region.

Given the Chinese economy's profound reliance on access to foreign resources and markets, Beijing has a substantial interest in the openness of maritime trade routes and the preservation of a stable international system. Chinese writings on carriers are replete with examples of their utility in nontraditional security situations. For example, they cite how USS *Lexington* was able to supply 30 percent of the power requirements of the city of Tacoma, Washington, during a power shortage in the winter of 1929–30. They write also of the roles carriers played in disaster relief in the Caribbean and Gulf of Mexico in the 1950s, an example that almost certainly resonates with a Chinese audience aware that the PLAN was able to do little after the 2004 Indian Ocean tsunami, while USS *Abraham Lincoln* (CVN 72), on the scene within days, provided relief. These analysts note how carriers' ability to rapidly swap their normal fixed-wing aircraft complements for helicopters enhances their multimission capabilities.⁸⁴ They overlook here the point that reconfiguring a deployed carrier's embarked air wing for humanitarian operations could require either foreign bases or substantial overseas base access.⁸⁵ That issue has still not been addressed fully in China, despite such small-scale precedents as the use of the Khartoum, Sudan, airport in March 2011 to refuel PLA Air Force Il-76 transports evacuating Chinese nationals trapped in Libya. Should civilian leaders press a reluctant PLAN to do so, Chinese aircraft carriers could contribute in such ways to global "public goods." Counterpiracy operations, global peacekeeping, humanitarian assistance, and disaster relief are all missions available to a Chinese carrier fleet that would be in concert with American interests.

Indeed, the U.S. Navy's concept of "global maritime partnerships" would be much closer to realization with the PLAN as a resourceful and reliable partner in preserving a stable and open international system. The prospect of the American and Chinese navies—along with those of several other rising Asian naval powers—working together to address shared challenges is in many ways the best possible outcome for an American fleet confronting a financially constrained future. In the words of Admiral Eric McVadon, USN (Ret.),

One can readily imagine a scenario in which U.S. Navy F-18s from carriers are in air-to-air combat with [PLAN] Su-30s over the Taiwan Strait. One can just as readily imagine those same F-18s along with U.S. Navy P-3Cs providing air cover and search capability, respectively, for PLAN and other ships of an international naval force protecting sea lanes from pirates and terrorists in the Gulf of Aden or even the Pacific Ocean sea lanes as oil bound for China is imperiled by some future development.⁸⁶

Such an arrangement would reduce a burden currently borne almost entirely by American naval power by distributing it through a new, twenty-first-century form of collective security in which a great power's prestige is proportional to the public goods it provides. A carrier would allow China (like France with *Charles de Gaulle*) to "punch above its weight," to make a visible contribution—even if flying only a modest number of sorties—that destroyers and frigates simply cannot.

But Beijing could also use aircraft carriers in a negative, exclusionary manner that would place China in opposition to the continued military presence of the United States in East Asia, and more generally to the international status quo. For this purpose a Chinese carrier group need not be designed to oppose U.S. forces directly—China is developing a wide range of antiaccess weapons systems, many missile-focused, for that task—but rather to provide, in a variety of Near Seas scenarios, including a conflict over Taiwan, air defense to surface vessels (e.g., Luyang II destroyers) that can shoot large numbers of antiship cruise missiles. A second role for a Chinese carrier group has been outlined in a variety of Chinese doctrinal publications: flying air cover for an amphibious invasion of islands and reefs beyond the range of land bases, a scenario that would clearly be relevant in a South China Sea conflict.⁸⁷

Were China to decide to use its carrier force in an attempt to exclude American naval power, the results would be disastrous for regional stability and, ultimately, for China itself. The United States has a long history of using military force to preserve its access to international sea-lanes; it fought its first four wars after independence—the naval war with France in the 1790s, the First Barbary War (1801–1805), the War of 1812, and the Second Barbary War (1815)—at least in part over just that.⁸⁸ While reactions are impossible to predict exactly, it is clear that Washington would view most gravely any effort to restrict its access to foreign sea-lanes. Indeed, Secretary of State Hillary Clinton described freedom of navigation in the South China Sea as a "national interest" when she addressed the Association of Southeast Asian Nations Regional Forum in 2010.

While much will depend on how China decides to use its new and future carriers, American strategists should formulate both short- and long-term responses to protect American interests and, if possible, avoid competition or conflict with China. While immediate actions should focus primarily on political shifts, a long-term shift in military posture, engagement with the PLAN, and changes to alliances and partnerships in East and South Asia will all be required to respond adequately to the prospect of multiple Chinese carriers operating throughout the Asia-Pacific.

In the short and middle terms, American reactions to China's new carrier should focus primarily on shifts in military and political posture. While existing military

contingency plans and exercises should be reexamined to take account of a Chinese aircraft carrier, few explicit military adjustments will be necessary immediately. The former secretary of defense, Robert Gates, signaled America's intention to increase its military presence in Southeast Asia in his 2011 speech at the Shangri-La Dialogue in Singapore, where he announced the future stationing of American littoral combat ships in that island nation and, more generally, America's intention to increase its activity in the region. Secretary of Defense Leon Panetta has signaled his

Senior Liberation Army Daily reporter, Sr. Col. Guo Jianyue, PLA: "Why did we build it if we don't have the courage and willingness to use the aircraft carrier to handle territorial disputes?"

intent to continue this approach, informing the Senate Armed Services Committee that "[the Defense Department] should maintain an enduring military presence in the Asia-Pacific region that provides a tangible reassurance that the Unit-

ed States is committed to Asia's security, economic development, and the prosperity essential to the region's success."⁸⁹

Just as a Chinese aircraft carrier sailing and visiting ports throughout the Asia-Pacific would send a message, an increase in naval presence by the U.S. Navy would likewise reassure the region of America's ability and will to sustain its regional engagement. That presence should be expanded especially in the South China Sea and Indian Ocean; indeed, Gates's 2011 announcement should be regarded as a first step in a broader effort to sustain American military presence in the region. The frequency of port visits and freedom-of-navigation exercises should be increased, and naval engagement with new and existing partners should be regularly and responsibly strengthened.

The long-term challenges potentially posed by China's aircraft carrier ambitions, however, demand also a concerted examination of political strategy toward China and of military posture in the Asia-Pacific. First, a powerful China that contributes to the international system is overwhelmingly in the interests of the United States in particular and of regional stability and prosperity in general. Military engagement with China, especially with the PLAN, must therefore be of a top priority for U.S. military and political leadership. The benefits of naval cooperation and the dangers of confrontation should become core subjects of U.S.-Chinese dialogues at all levels. Responsible engagement and substantial progress should be goals for both sides. To that end, the U.S. military should work with its allies and partners in the region to identify opportunities for naval cooperation with the PLAN. Humanitarian assistance and disaster relief, counterpiracy operations, and search and rescue all offer opportunities to promote habits of cooperation and reduce strategic mistrust—provided the PLAN's civilian masters are willing to make such contributions to the larger good.

But American strategists must also plan and account for more negative possibilities. America's network of foreign bases in Japan and the Republic of Korea has traditionally been the foundation of its access to East Asia, and the three nations concerned are currently examining how to adapt basing arrangements to twenty-first-century challenges. Yet more must be done—the United States should examine possibilities for military access in South and Southeast Asia as well.

The Pentagon has deftly characterized desirable future access arrangements as “geographically distributed, operationally resilient and politically sustainable.”⁹⁰ In South and Southeast Asia, meeting these criteria will likely mean agreements that are less formalized and more implicit than the explicit, treaty-based arrangements familiar in Northeast Asia. While states like Vietnam, Indonesia, and India are concerned about China's rising naval power and will likely seek to help sustain American access to the region, they have no interest at all in hosting American bases and fear being entangled in a future U.S.-Chinese conflict. Agreements will therefore focus on facility capabilities rather than basing agreements, with access to be determined by host nations in times of crisis or conflict, on the basis of their own political and military calculations.

The one likely exception would be America's Australian ally. Canberra has signaled its concern about China's rising naval capabilities and has identified the United States as its key ally for the twenty-first century.⁹¹ Given the closeness of the two nations and their shared perceptions of potential future security challenges involving the PLAN, Washington should seek to make Australia a new cornerstone of American posture in the Asia-Pacific, almost on a par with Japan or Korea. Access to and facility support by Australia is forthcoming, and will likely be crucial in the coming years.⁹²

China's aircraft carrier development path follows the Chinese philosopher Laozi's logic that “a journey of a thousand miles begins with a single step.” The journey will be long and tortuous, but China must start somewhere if it hopes to become proficient in high-intensity carrier operations—hence the need for a starter carrier, *ex-Varyag*.

Deng Xiaoping, describing his plan to reform and open China in the late 1970s, declared that China would “cross the river by feeling the stones,” meaning that he had no overarching plan but would remain flexible and adapt to events as they happened, while maintaining a general course forward. Beijing's approach to aircraft carriers appears to be taking a similar path—there seems to be no overriding design for what shape an aircraft carrier force would ultimately take and what missions it would undertake. Instead, the PLAN seems to be adaptive and flexible in its approach—purchasing carriers as they become available, while gradually

working up its first, refurbished one, slowly assembling the components of an escort group, and quietly training its first generation of carrier aviators.

In the nearer term, with respect to its starter carrier, China will likely follow the same course. The PLAN will learn a great deal from it and seek to apply the lessons to forthcoming platforms. Future iterations will therefore likely be more capable and utilized more effectively in operational terms. Similarly, the missions these ships are assigned will likely evolve over time, gradually testing the abilities of their technologies and crews. Just as the first generations of American naval aviators were far different from their descendants today, so too will future generations of Chinese naval aviators be more professionally sophisticated and capable than their predecessors. Having waited over eight decades for a carrier of its own, China can afford to be patient and methodical in mastering its operation.

China has every sovereign right to invest its newfound wealth in an aircraft carrier or even several. The strategically significant questions concern not the number and capabilities of these ships but how they will be employed. If Beijing chooses to use its carriers to cooperate with its neighbors and the United States and contribute thereby to the health and success of the international system, it will likely inaugurate a new era of strategic collaboration. If, on the other hand, Beijing chooses to use its carriers to intimidate or threaten its neighbors and the United States, to challenge the fundamental openness and stability of the international system, great-power competition and conflict will become more likely.

As ever, the determining factor is not the weapons system itself but how it is used. As Major General Qian Lihua declared in November 2008, “The question is not whether you have an aircraft carrier, but what you do with your aircraft carrier.”⁹³

NOTES

The authors thank Nan Li, Robert Rubel, and Christopher Weuve for their detailed insights and wording suggestions.

1. 罗援 [Luo Yuan], “谨防航母报道中的浮躁现象” [Strictly Guard against Impulse Reporting on the Aircraft Carrier], 人民网 [People’s Net], 16 August 2011, military.people.com.cn/.
2. William Choong, “Reasons to Fear China’s Aircraft Carrier,” *Straits Times*, 19 August 2011, www.asianewsnet.net/.
3. Viola Gienger and Tony Capaccio, “China’s Carrier Poses Mostly Symbolic Threat, U.S. Admiral Says,” *Bloomberg*, 12 April 2011, www.bloomberg.com/.
4. John Frewen, “Harmonious Ocean? Chinese Aircraft Carriers and the Australia-U.S. Alliance,” *Joint Force Quarterly*, no. 59 (4th Quarter 2010), www.ndu.edu/press/.
5. Fumio Ota, “The Carrier of Asia-Pacific Troubles,” *Wall Street Journal*, 11 August 2011.
6. Hu Yinan and Li Xiaokun, “Carrier Set for Maiden Voyage,” *China Daily*, 28 July 2011, www.chinadaily.com.cn/.
7. Jaime FlorCruz, “China’s Military Modernization a Cause for Concern?,” CNN.com, 17 June 2011, articles.cnn.com/.

8. Office of Naval Intelligence [hereafter ONI], *The People's Liberation Army Navy: A Modern Navy with Chinese Characteristics* (Suitland, Md.: August 2009), www.oni.navy.mil/.
9. 刘华清 [Liu Huaqing], 刘华清回忆录 [The Memoirs of Liu Huaqing] (Beijing: People's Liberation Army, 2004), p. 477.
10. Liu Huaqing was technically still a general and spent most of his career in army billets. The first PLAN commander who was a career navy man was Shi Yunsheng (1996–2003). ONI, *China's Navy 2007*, available at www.fas.org/.
11. Cai Wei, “礼仪帅的航母梦” [Dream of the Military of Courtesy for Aircraft Carriers], 三联生活周刊 [Sanlian Life Weekly], 27 April 2009, pp. 50–57.
12. “中国的海洋权益和海军” [China's Maritime Rights and Navy], 世界知识 [World Knowledge] (January 2009), pp. 16–25.
13. “Earnestly Step Up Ability Building within CPC Organizations of Armed Forces,” 解放军报 [Liberation Army Daily], 13 December 2004, available at www.chinamil.com.cn/; “三个提供，一个发挥” [Three Provides and One Bring into Play], 新浪 [Sina], news.sina.com.cn/.
14. Hu Jintao, as cited in Tang Fuquan and Wu Yi, “A Study of China's Sea Defense Strategy,” 中国军事科学 [China Military Science], no. 5 (2007), p. 93; Nan Li and Christopher Weuve, “China's Aircraft Carrier Ambitions: An Update,” *Naval War College Review* 63, no. 1 (Winter 2010), p. 15.
15. Nan Li, “The Evolution of China's Naval Strategy and Capabilities: From ‘Near Coast’ and ‘Near Seas’ to ‘Far Seas,’” *Asian Security* 5, no. 2 (June 2009), p. 160.
16. 海韬, 梁嘉文 [Hai Tao and Liang Jiawen], “中国首艘航母‘诞生’记” [A Record of the “Birth” of the First Chinese Aircraft Carrier], 国际先驱导报 [International Herald Leader], 19 April 2011.
17. “中国航母试航共解决9项内容” [China's Aircraft Carrier Trials Resolved 9 Content Areas], 中评社 [China Review News], 19 August 2011, gb.chinareviewnews.com/.
18. Deck handling of aircraft alone is an important, complex issue that could require extensive Chinese practice, procedure development, codification, and training. Nothing can be taken for granted in at-sea operations. PLAN personnel will need to learn how to stand watch; master damage-control procedures; connect aircraft to auxiliary electrical power, move them around the flight deck, send them up and down elevators to and from the hangar deck, tie them down to keep them from sliding into the sea when the carrier heels in a sharp turn, and then untie, unchock, and move them into takeoff position; and operate command and control and radars—under all possible conditions, including heavy seas.
19. “HHQ-9,” *Jane's Strategic Weapon Systems*, jsws.janes.com/; “HHQ-9A,” Deagel.com.
20. U.S. Defense Dept., *Military and Security Developments Involving the People's Republic of China 2011: Annual Report to Congress* (Washington, D.C.: August 2011), p. 46, available at www.defense.gov/.
21. “China Hudong Zhonghua Wins \$1 Billion LNG Ship Orders,” Reuters, 17 July 2011, www.reuters.com/.
22. Ibid.
23. “Hudong to Build Four LNG Carriers for MOL (China),” *LNG World News*, 10 December 2010, www.lngworldnews.com/.
24. “China's Maritime Rights and Navy,” pp. 16–25.
25. U.S. Defense Dept., *Military and Security Developments Involving the People's Republic of China 2011*, p. 46.
26. ONI, *People's Liberation Army Navy*, p. 19.
27. U.S. Defense Dept., *Military and Security Developments Involving the People's Republic of China 2011*, p. 46.
28. “GAIC JJ-7B and JT-9,” *Jane's All the World's Aircraft*, 17 October 2011, www.janes.com/.
29. 西岗 [Xi Gang], “谁来支撑航母编队?” [Who Will Support the Aircraft Carrier Formation?], 南方周末 [Southern Weekend], 11 August 2011, available at news.sina.com.cn/.
30. 李菁 [Li Qing], “航母一代: 带领中国走向深蓝” [A First-Generation Aircraft Carrier: Taking China into the Deep Blue], 三联生活周刊 [Sanlian Life Weekly], 17 June 2011, pp. 52–60.
31. See Kenneth Allen and Aaron Shraberg, “Assessing the Grade Structure for China's

- Aircraft Carriers: Parts 1 and 2," *China Brief*, 15 and 29 July 2011, www.jamestown.org/.
32. Xi Gang, "Who Will Support the Aircraft Carrier Formation?"
 33. 邓佑标 [Deng Youbiao], "海军大连舰艇学院首次招收飞行学员" [Dalian Naval Vessel Academy Recruits Flight Students for the First Time], *Liberation Army Daily*, 5 September 2008, p. 5.
 34. *Dalian Naval Academy* (海军大连舰艇学院), www.dljy.edu.cn/.
 35. Nan Li, "Similarities and Differences in American and Chinese Naval Education: Implications for Cooperation," in *China, the United States, and 21st Century Sea Power: Defining a Maritime Security Partnership*, ed. Andrew Erickson, Lyle Goldstein, and Nan Li (Annapolis, Md.: Naval Institute Press, 2010), p. 416.
 36. *Ibid.*, p. 421.
 37. U.S. Defense Dept., *Military and Security Developments Involving the People's Republic of China 2011*, p. 46.
 38. Robert C. Rubel, "The U.S. Navy's Transition to Jets," *Naval War College Review* 63, no. 2 (Spring 2010), p. 51.
 39. *Ibid.*, p. 52.
 40. A catapult must be reset constantly to accommodate given aircraft types and gross weights: too much steam and the launch gear will rip off, too little and the aircraft will fall into the sea.
 41. Like catapults, arresting gear must be reset constantly based on aircraft type and "bring aboard" weight on landing; the aircraft's weight must be calculated to ensure that it does not exceed the "max trap," and payload must be jettisoned if necessary.
 42. For the new Japanese design, see Yoji Koda, "A New Carrier Race? Strategy, Force Planning, and JS Hyuga," *Naval War College Review* 64, no. 3 (Summer 2011), pp. 31–60.
 43. Catapults enable aircraft to take off without wind, even slightly downwind in the case of *Nimitz*-class aircraft carriers with their powerful catapults. Aircraft on ski-jump carriers must take off straight into the wind, placing a premium on monitoring changing wave action and wind conditions. The ski jump itself may produce a "bubble" of turbulence that must be factored in. In either case, crosswinds and tailwinds must be avoided.
 44. 胡威 [Hu Wei], "中國航母在建 不會駛入他國" [Aircraft Carrier under Construction in China Will Not Enter Another Country], 香港商報訊 [Hong Kong Commercial Daily], 7 June 2011, www.hkcd.com.hk/.
 45. U.S. Defense Dept., *Military and Security Developments Involving the People's Republic of China 2011*, p. 3.
 46. *Ibid.*, p. 46.
 47. *Ibid.*, p. 3.
 48. Li Qing, "First-Generation Aircraft Carrier," pp. 52–60.
 49. "著名军事专家尹卓少将谈航空母舰与现代战争" [Renowned Military Expert Rear Admiral Yin Zhuo Comments on Aircraft Carriers and Modern Warfare], 人民网强国论坛 [Strong Nation Forum, People's Daily Online], 14 April 2011, www.people.com.cn/.
 50. A carrier has a radar horizon of roughly thirty nautical miles; this could in theory allow data-linked UAVs to connect it with escort ships as far as sixty nautical miles out, but an unrealistic number of ships would be required to support 360-degree coverage. Single-axis support would be more feasible.
 51. David Axe, "Chinese Navy Drone Spotted," *Diplomat*, 26 June 2011, the-diplomat.com/.
 52. The authors are indebted to Robert Rubel for his input concerning this section.
 53. "中国航母或于6日试航" [Chinese Aircraft Carrier Begins Six Days of Sea Trials], 共同网 [Kyodo News], china.kyodonews.jp/.
 54. 龙腾, 日月 [Long Teng and Ri Yue], "直-8雷达机的性能和装备价值" [The Performance and Equipment Value of the Zhi-8 Radar Helicopter], 现代舰船 [Modern Ships] (January 2011), pp. 12–16.
 55. "Surveillance Aircraft," *Chinese Military Aviation*, s.v. "Ka-31," cnair.top81.cn/.
 56. In this context, "path-dependent" means that future development decisions will be limited by those being made at present, even after the conditions that motivated the original decisions may no longer be operative.
 57. 任旭, 侯亚铭 [Ren Xu and Hou Yaming], "舰载机: 航母的'手臂'" [Carrier-borne

- Aircraft: The Aircraft Carrier's "Arm"], *Liberation Army Daily*, 11 April 2011, p. 8.
58. After *Enterprise* the United States built four conventionally powered carriers (the *Kitty Hawk* class) before going back to nuclear power in the 1970s, during a major energy crisis.
 59. "Renowned Military Expert Rear Admiral Yin Zhuo Comments on Aircraft Carriers and Modern Warfare."
 60. ONI, *People's Liberation Army Navy*, p. 45.
 61. See Daniel J. Kostecka, "Places and Bases: The Chinese Navy's Emerging Support Network in the Indian Ocean," *Naval War College Review* 64, no. 1 (Winter 2011), pp. 59–78.
 62. The authors thank Nan Li for these points.
 63. Zhang Yuliang et al., 战役学 [Science of Campaigns] (Beijing: National Defense Univ. Press, 2006).
 64. Pan Xiaomin and Wu Chao, "Fierce Tigers of Land Warfare Quietly Invade Unnamed Reef," 人民海军 [People's Navy], 17 December 2008; Wei Gang, Li Yanlin, and Wu Chao, "A Chinese Naval Ship Formation Conducts the First Long-Voyage Training Sail around the South China Sea," *People's Navy*, 2 December 2008; Bai Yang, "Three Underway Replenishment Records Have Been Reset," *People's Navy*, 22 June 2009.
 65. Minnie Chan, "Challenge Will Be Training Pilots, Ex-general Says," *South China Morning Post*, 1 April 2010.
 66. 解放军报记者郭建跃 [Liberation Army Daily Special Reporter Guo Jianyue], "军报: 若没勇气用航母解决领土争端造它干啥?" [Military Newspaper: Why Build an Aircraft Carrier If We Lack the Courage to Use It to Resolve Territorial Disputes?], 中国军网 [China Military Online], 10 August 2011, jz.chinamil.com.cn/.
 67. Capt. Xu Ping, "Tentative Analysis of Hu Jintao's Strategic Thinking on Accomplishing Diversified Military Tasks," 中国军事科学 [China Military Science] (March 2010).
 68. The authors are indebted to Nan Li for this point.
 69. "B. Active Participation in Counterstrike Operations," in *Air Raid and Anti-Air Raid in the 21st Century* (Beijing: Liberation Army Press, May 2002).
 70. 薛兴林 [Bi Xinglin], ed., 战役理论学习指南 [Campaign Theory Study Guide] (Beijing: National Defense Univ. Press, 2002), pp. 107, 228–56.
 71. See Kostecka, "Places and Bases."
 72. Li Jie, "How Big a Role Do Aircraft Carriers Play in Noncombat Operations? Part 1," 当代海军 [Modern Navy] (January 2009), and "How Big a Role Do Aircraft Carriers Play in Noncombat Operations? Part 2," *Modern Navy* (February 2009). Li is a research fellow of the Naval Research Institute.
 73. Sandy Woodward and Patrick Robinson, *One Hundred Days: The Memoirs of the Falklands Battle Group Commander* (Annapolis, Md.: Naval Institute Press, 1997).
 74. Quoted widely. See, for example, Ens. D. S. Dees, "A Billion Dollar Blunder," U.S. Naval Institute *Proceedings* 123/7/1, 133 (July 1997).
 75. Li and Weuve, "China's Aircraft Carrier Ambitions," pp. 16–17.
 76. U.S. Defense Dept., *Military and Security Developments Involving the People's Republic of China 2011*, p. 41.
 77. This formulation of the dramatic challenges facing China was coined by Kenneth Lieberthal. See Lieberthal, *Testimony to the House Committee on Foreign Affairs*, 23 July 2008, available at foreignaffairs.house.gov/.
 78. Li Jie, "How Big a Role Do Aircraft Carriers Play in Noncombat Operations?," parts 1 and 2.
 79. Ji Beibei, "Military Needs at Least Three Aircraft Carriers, Says Expert," *Global Times*, 11 July 2011, www.globaltimes.cn/.
 80. U.S. carriers are not always accompanied by all of their escorts. They deploy in large battle groups, but ships are often detached on individual taskings.
 81. *Joint Press Release: Indo-French Bilateral Naval Exercise: Varuna 1*, 4 January 2011, indiannavy.nic.in/.
 82. Li Jie, "How Big a Role Do Aircraft Carriers Play in Noncombat Operations?," parts 1 and 2.
 83. *Bohai Shipbuilding Heavy Industry Company*, www.bshic.com/gsjj/.
 84. Li Jie, "How Big a Role Do Aircraft Carriers Play in Noncombat Operations?," parts 1 and

2. See also Bruce A. Elleman, *Waves of Hope: The U.S. Navy's Response to the Tsunami in Northern Indonesia*, Newport Paper 28 (Newport, R.I.: Naval War College Press, 2007), available at www.usnwc.edu/press/.
85. This might be particularly important for ambitious long-distance operations. If sailing from home port, and if fixed-wing aircraft not needed for the mission could be stowed below deck while leaving sufficient space for helicopter operations on the flight deck, access to overseas facilities to park unused aircraft might not be necessary.
86. Eric McVadon, "The U.S. Navy and the Chinese Aerospace Challenge," in *Chinese Aerospace Power: Evolving Maritime Roles*, ed. Andrew S. Erickson and Lyle Goldstein (Annapolis, Md.: Naval Institute Press, 2011), p. 478.
87. See Wang Houqing, 战役学 [Science of Campaigns] (Beijing: May 2000); and Zhang Yuliang et al., *Science of Campaigns*.
88. For the naval war with France, see Donald R. Hickey, "The Quasi-War: America's First Limited War, 1798–1801," *Northern Mariner/Le marin du nord* 18, nos. 3–4 (July–October 2008), pp. 67–77, available at www.cnrs-scrn.org/.
89. "Advance Policy Questions for the Honorable Leon Panetta Nominee to Be Secretary of Defense," p. 45, available at armed-services.senate.gov/.
90. John D. Banusiewicz, "Gates Describes U.S. Approach to Deterrence in Asia," American Forces Press Service, 5 June 2010, www.defense.gov/.
91. Government of Australia, *Defending Australia in the Asia Pacific Century: Force 2030* (Canberra: Department of Defence, 2009), available at www.defence.gov.au/.
92. Andrew Shearer, "The Yanks are Welcome in Oz," *Wall Street Journal Asia*, 15 September 2011, p. 15.
93. Mure Dickie and Martin Dickson, "China Hints at an Aircraft Carrier," *Financial Times*, 16 November 2008, us.ft.com/. For similar logic from Maj. Gen. Huang Guozhu, editor in chief of the PLA's newspaper, see "Put China's Aircraft Carrier into Perspective," *Liberation Army Daily*, 25 August 2011, eng.mod.gov.cn/.



THE REPUBLIC OF KOREA'S COUNTER-ASYMMETRIC STRATEGY

Lessons from ROKS *Cheonan* and Yeonpyeong Island

Captain Duk-Ki Kim, Republic of Korea Navy

Since its provocations against Yeonpyeong Island on 23 November 2010, North Korea's asymmetric threats have emerged as one of the most momentous security issues for the Republic of Korea (ROK).¹ After bitter defeats in the First and Second Yeonpyeong Sea Battles, as well as in the Daechung Sea Battle of November 2009, North Korea recognized its disadvantage in symmetric surface-ship provocations. It resorted instead to new and unexpected tactics, utilizing its latest small submarine to torpedo ROKS *Cheonan* on 26 March 2010.

Considered to be the North's severest military provocation since the Korean War armistice, the sinking of ROKS *Cheonan* gravely shocked every aspect of Korean society—political, diplomatic, psychological, and military—and

caused deep ripples across the range of Northeast Asian security. China, which had been adhering to a neutral stance, commenced shuttle diplomacy, dispatching Wu Bangguo, head of the National People's Congress, to both Koreas. However, although much time has passed since the incident, in which the North might have taken a different path, it has instead underscored its nuclear threat by enriching uranium, and China has safeguarded Pyongyang by proposing guidelines for a resumption of the Six Party Talks that would be difficult for the United States, Japan, or Russia to accept. The result has been a further cooling of North Korean–South Korean relations, and conflicts between the United States and China have also surfaced.

Captain Kim, who earned a PhD in political science at Hull University in England, has served in the Office of the Secretary of the Blue House, the official residence and executive office of the president of the Republic of Korea (ROK); as the first Commanding Officer of ROKS King Sejong the Great, the ROK Navy's first Aegis destroyer; and as policy adviser for Chief of Naval Operations. He is currently head of the Military Cooperation Department in the Strategic Planning Bureau of the ROK Joint Chiefs of Staff. He is the author of, among other books and articles, Naval Strategy in Northeast Asia and 21세기 중국 해군 (The People's Liberation Army Navy for the 21st Century).

The problem that besets the Korean Peninsula lies in the unavoidable fact that the ROK's vulnerability has increased as North Korea's asymmetric threat has expanded and diversified. The current threat is a conventional weapon-based war capability that includes chemical, biological, and radiological (CBR) weapons, long-range artillery (LRA), special operations units, and underground tunnels. However, it is rapidly expanding to one of nuclear and high-technology weaponry (e.g., cyberwarfare, electronic warfare, hovercraft, and air-cushion stealth warships).² When these separate asymmetric assets are combined, the North's capabilities and military options will be greatly strengthened. They will pose a serious threat to the ROK military, because they can be used both as core means of attack during wartime and for localized provocations in peacetime.

The ROK is currently facing the difficult question of how to cope with the development of these asymmetric capabilities. Based on lessons it learned from these most recent attacks, the ROK has focused on not only reshaping its military strategies but also strengthening its capabilities to deal with the North's asymmetric threats and enhancing "jointness" (합동성) among its services.

The strategic challenge posed by an asymmetric strategy concerns the relationship between the weak/poor and strong/wealthy. Regardless of how strong and wealthy a state is, if it fails to comprehend the strengths of the weak and poor, it is destined to fail. Asymmetric solutions of "yisojaedae" (以小制大, "conquering large forces with small ones") always exist, enabling the weak and poor to exploit vulnerabilities of the strong and wealthy. The former can undermine and debilitate the latter's military superiority by means of a diplomatic strategy that capitalizes on that very superiority through "yiyijaeyi" (以夷制夷, "using the enemy against itself"). Globalization and networking have been pillars of strength for the strong/wealthy, but they offer opportunities against them for the weak/poor; weaknesses within globalization and networking can be cleverly used to nullify the strengths of their intended beneficiaries. Finally, though major twenty-first-century militaries have been revolutionized by information technology, their new capabilities for battlefield awareness, information sharing, and long-range precision strikes are ineffective against irregular and guerrilla warfare, subversion, and destabilization.

To explore these issues in some detail, this article will analyze the North's asymmetric threat from various dimensions and propose counter-asymmetric concepts and strategies for the South.

A NEW ASYMMETRIC THREAT FROM NORTH KOREA

North Korea was one of the early exponents of asymmetric warfare. Combining Soviet conventional doctrine (operations by mechanized units in the enemy's depth) and Mao Zedong's concepts of irregular struggle (People's War, guerrilla

and political-psychological warfare), the North has developed a bold form of combined regular/irregular warfare for the purpose of rapidly conquering the South, before U.S. reinforcements can be deployed on the peninsula. The North's methods emphasize the speed of regular warfare but at the same time recognize its limitations.

Background and Development

Having observed the ineffectiveness of America's high-tech forces in Vietnam, Pyongyang aspired to re-create Vietnam and its armed unification on the Korean Peninsula. It drastically increased its military in 1970 and greatly improved its conventional and asymmetric capabilities. The latter included tunnels, which allow the North to infiltrate the Demilitarized Zone.

The end of the Cold War, the ROK's creation of diplomatic ties with Russia and China, an increasing gap in national power, the death of Kim Il-sung, and its own deteriorating economy, along with other foreign and domestic issues in the 1990s, led North Korea to enhance its capabilities for asymmetric warfare as its new survival strategy. At a political level, the North adopted the concept of "kangsung daeguk" (강성대국, "strong and prosperous nation") and the "sungun jeungchi" (선군정치, "military-first politics"). At the military level it brought out nuclear weapons, missiles, and threats to envelop Seoul in flames. The North has actively played its political cards to realize its military goals, and despite numerous difficulties, it has done so successfully. The nation has staged a continuous series of armed demonstrations: launching a long-range ballistic missile on 5 April 2009, conducting a second nuclear test on 25 May that year, initiating a distributed-denial-of-service (DDOS) cyber attack on 7 July 2009, and firing short-ranged missiles on several occasions. Later the North changed its strategy to one of "miso" (미소, "little smile," a false suggestion of reconciliation), but receiving only a meager response from the ROK, decided to make a new move, torpedoing ROKS *Cheonan* on 26 March 2010, killing forty-six crew members, and bombarding the inhabited island of Yeonpyeong on 23 November, killing four people. Experts believe that this series of provocations was initiated on the basis of its confidence in the development and possession of nuclear weapons.

A Hypothetical Scenario: Mixed and Full-Scale Warfare

As a countermeasure to North Korea's asymmetric strategies, the South has focused on nurturing an elite army of superior quality and strengthening the ROK-U.S. Joint Defense System and Rear Integrated Defense System. Meanwhile, the North has continuously developed new asymmetric threats that include nuclear and CBR weapons, missiles, LRA, special operations units, cyber weapons, electromagnetic pulse (EMP) weapons, Global Positioning System (GPS)–disturbance devices, submarines and minisubs, and online political and psychological warfare.

For limited provocations the North will apply these tactics, separately or combined, to a modest degree, but in the case of full-scale war we expect it to employ its assets fully through integration, combination, and mixing. The speed, pressure, shock, scale, and intensity of destruction would be immense.³

It is expected that the North Korean regime will first conduct a simultaneous and multifarious cyber offensive on the Republic of Korea's society and basic infrastructure, government agencies, and major military command centers while at the same time suppressing the ROK government and its domestic allies and supporters with nuclear weapons. If the North succeeds in developing and deploying its EMP weapons, it will be able to paralyze electronic functions as well. Moreover, the North will launch an offensive with its diverse collection of missiles (including the recently developed KN-01 and KN-02) and long-range artillery against the strategic center of the ROK, inflicting terror and realizing its threats to make Seoul an ocean of flames.

The North Korean regime will conduct a rapid front-and-rear combined operation to seize and conquer the Greater Seoul Metropolitan Area while carefully monitoring the ROK's and international community's response. Furthermore, it will infiltrate the South by deploying special operations units by land, sea, and air in multiple ways not only to disturb and disperse ROK forces but also to conquer Seoul and use it for bargaining leverage. Should the South decline its terms, the North will immediately expand its operations to sweep and conquer the entire nation, seeking to do so before U.S. reinforcements arrive. At this point North Korean forces will not be greatly concerned with logistic support, since they expect to be able to use the South's resources, especially in Greater Seoul.

Even if the North's invasion operation does not progress as planned and encounters a ROK-U.S. counteroffensive, North Korea has no reason to be pessimistic, since it expects the South to accept an armistice immediately if threatened by nuclear missiles. In fact, it will be difficult for the United States to intervene actively at all should the North threaten nuclear employment. Moreover, North Korea calculates that against a backdrop of nuclear threats, pro-North leftists in South Korean society will stir anti-American sentiments, warning of nuclear attacks if the United States intervenes. When the Northern regime initially declares war, these parties may create a dangerous possibility of proactive sympathizing forces emerging within South Korean society.

Although this hypothetical scenario is gravely pessimistic, it is neither ungrounded nor irrelevant. From the perspective of preparing for the worst, it is crucial that the South increase interest in how to counter not only combined and full-scale campaigns but also separate, fragmented, and local asymmetric threats.

Hubris and overconfidence represent serious risks for the Republic of Korea. Seoul must not underestimate the strength of Pyongyang's military just because

of its own absolute economic superiority. Moreover, we must not disparage North Korean soldiers and surmise that they lack combat abilities merely because their country is poor and small, uses ageing and obsolete weapons, and lacks sustainment capabilities. In addition to its variety of asymmetric assets and employment methods, North Korea has been analyzing lessons from the 2003 Iraq war, instructing its people in firearms and suicide bombing, and indoctrinating them in the idea of defending the “great leader” with their lives and in an ideology that combines these concepts.

THE ROK’S COUNTER-ASYMMETRIC STRATEGIES: ANALYSIS

The South’s overall national power currently surpasses that of the North. Although the North’s territory is about twenty thousand square kilometers larger than the South’s, the population of the South is nearly double that of the North, and its economic strength is about thirty times superior. Furthermore, the South’s foundational regime and governing system are far better than those of the North. Whereas the South has pursued a liberal democracy, a market economy, and a social welfare system, the North has maintained a communist dictatorship, a hereditary regime, and national militarization based on “kangsung daeguk,” “sungun” (선군), and “juche” (주체).⁴ While the South has established neighborly relationships with other nations around the world, acting as befits a major economic power and serving as host of a Group of Twenty 2010 summit, the Northern regime has been criticized and isolated for its development of nuclear weapons, proliferation of weapons of mass destruction (WMDs), counterfeiting of U.S. dollars, trafficking in drugs, smuggling, and other internationally outlawed activities.

At the military level, despite the fact that the South’s military spending is between a tenth and fifteenth of the North’s as a percentage of its gross domestic product, the ROK military’s actual size surpasses the North’s by approximately four times. The ROK has been developing a force of superior quality, whereas North Korea has been nurturing quantitative superiority. An overall comparative assessment of asymmetric quality and quantity shows that the two sides are roughly equivalent. The ROK is weaker with regard to field artillery and submarines but maintains similar levels in tanks, surface warships, and fighter jets. Furthermore, the South has continuously developed its quality-based capabilities in network-centric warfare (NCW), whereas the North has focused on nuclear weapons and other WMDs.⁵ Where the South has concentrated on deterrence and proactive-defense through combined ROK-U.S. forces, the North has pursued preemptive surprise-attack and lightning-war strategies. The ROK forces are controlled by the people and operate under an integrated system. The North’s military lacks comparable training opportunities due to the nation’s deteriorating

economy, but it has been told that long-term service and “sungun” military-first policies have kept individual training levels high.⁶

The South’s counter-asymmetric strategies can be subjected to “SWOT analysis,” a tool that—focusing on strength, weakness, opportunity, and threat—is widely used for future planning by corporations. From this perspective, North Korea’s greatest weakness lies in its internal inconsistency stemming from economic problems (insufficient food, energy, and foreign currency reserves), a hereditary dictatorship, and the “sungun” policy. In its current system, market competition is impossible, and there is a growing likelihood of implosion were it to open its economy to the world. Accordingly, the North Korean regime has exploited Greater Seoul’s proximity to the armistice line to hold it hostage to nuclear blackmail and so strategically counterbalance its weaknesses all at once.

It is crucial that South Korea take into consideration the two main aspects—conventional and irregular—of the North’s asymmetric strategies and develop proper responses to them. The ROK’s national power is superior to that of the North. The ROK must utilize this crucial asset by achieving the status of an advanced military power, through human and hardware reserves, while not excessively burdening the people. This will achieve deterrence at low cost. The ROK must also heighten and strengthen the ROK-U.S. relationship into a comprehensive security alliance. Cooperation with China is essential, but not at the cost of damaging the U.S. alliance. Lastly, the ROK must maintain friendly relations with neighboring powers (especially China), promoting a favorable environment for ROK-led deterrence and reunification.

Active protection of Greater Seoul from North Korean WMDs is difficult due to its proximity to the front line. Therefore, the ROK must be able to prevent and deter North Korean WMD threats by means of its high-tech NCW assets. First, taking advantage of its budgetary and technological capacity, the South must secure asymmetry in long-distance, detailed surveillance and reconnaissance as well as in multilevel missile defense. Second, the ROK must transform Greater Seoul’s locational weakness into a strength, by nurturing and developing its mobile reserve forces (especially assets already in the area) along with standing forces, under a “total force” concept. Third, with nuclear, intelligence, and missile-defense support from the United States and relying on a solid alliance, the South must build, maintain, and operate an independent, superior, and high-tech military.

Finally, the South would do well to reconsider how it rotates high military officials on a two-year cycle. Although an excellent system in terms of work, this two-year cycle is simply too short to allow officials to contrive innovative ideas of asymmetry, and it results in a lack of professional knowledge and motivation. The North, in contrast, maintains a long-term-service system, relying on a small number of skilled military elites.

TABLE 1
MAJOR NORTH KOREAN ASYMMETRIC THREATS

Category	Threat	Intensity	Frequency
Core	Nuclear blackmail, hostage threats	A	B
	Threats to turn Seoul into sea of flames	A	B
Major	Threats on Five West Sea Islands	A	A
	Rear disturbance, infiltration threats	B	B
	Cyber-attack threats (DDOS, etc.)	C	A
	Electromagnetic-attack threats	C	B
	Political-psychological offensive threats	C	A
Mixed	Symmetric-asymmetric mixed-attack threats	A	D

Note: A = high; B = medium; C = low; D = very low.

DIRECTIONS FOR ROK COUNTER-ASYMMETRIC STRATEGIES

Seoul has adopted a “proactive deterrence strategy” to replace the previous passive and defensive-oriented strategy, which was shown to be ineffective by the two deadly attacks of 2010.⁷ Table 1 summarizes, in order of importance, the major North Korean asymmetric threats, including recent ones—nuclear, missile, and high-tech assets (cyber- and electronic-warfare units, air-cushion stealth warships, etc.).

Responses to Nuclear and Missile Threats

The North’s nuclear and missile assets are expected to increase, in both performance and quantity, and to be used to maximize strategic superiority.⁸ The South’s counter-asymmetry response is to rely on extended deterrence by the United States while independently pursuing a four-stage nonnuclear deterrence strategy (surveillance/reconnaissance, precision strike, interception, protection) based on high-tech network-centric warfare. Because the political and psychological shock of nuclear weapons is substantial, “nuclear versus nuclear” deterrence is accepted relatively easily but concepts of nonnuclear deterrence through technology seem hollow and ineffective. However, conventional, high-tech NCW has the potential for precise destruction of the enemy’s nuclear weapons and missiles before they are fired and for their rapid and accurate interception in flight.

First, we assess the feasibility of the former—offensive deterrence through network-centric assets. If the South secures a sufficient variety of NCW assets at a strategic level, it will be able to conduct simultaneous strikes on nuclear and missile facilities and other centers of gravity in parallel with “deep” decapitating and surgical strikes. The effects of such attacks in the Iraq war have been compared to those of nuclear weapons. Preemptive strikes in self-defense must be fully considered, since even one nuclear missile attack will have catastrophic consequences. It

is up to surveillance and reconnaissance assets to determine whether indications of nuclear missile strike are sufficient to the nation and its leaders to gain legal recognition of preemptive strikes as legitimate self-defense.

To implement an offensive deterrence strategy based on high-tech NCW, the ROK must first, at a joint level, design and gradually construct, improve, and expand a system of platforms (satellites, aircraft, manned and unmanned aerial vehicles), high-resolution sensors (electro-optical, infrared, synthetic aperture radar), and missiles (ballistic, cruise, and long-range precision-guided). Second, it must construct a fast and accurate command-and-control network and minimize decision-making time. Third, in the longer term, it must pioneer development of such innovative approaches as directed energy, nonfatal, and robot weapons.⁹ The ROK must also reevaluate the current ROK-U.S. missile agreement with regard to range and payload, increase efforts toward the agreement's modification and supplementation, and expand national defense research and development (R&D), in order to select, concentrate on, and amass relevant core technology.

To make feasible the latter defensive aspect of deterrence, the South must initiate a complex Korean missile-defense system. At the national defense level, it is vital that the South reexamine and redesign its missile-defense architecture, and at the joint level conduct—and, vitally, institutionalize—a three-dimensional assessment of its current programs. At the ROK-U.S. level, optimization of the missile-defense system, excellence in command and control, and intimate connection with regional American missile defenses are imperative.

It is important that the ROK take note of the Israeli missile-defense experience. The United States, with its expeditionary forces deployed around the world, has been developing its missile-defense system based on three major axes, for ground-based, sea-based, and air-based interception. Israel, in contrast, has been formulating and developing systems for short-range rocket defense (Iron Dome), lower-tier missile defense, and upper-tier defense (Arrow-2, Arrow-3/Block-2, -3, -4). This multilevel Israeli defense system is centered on a single axis (ground), as best suited to its local forces and as the most economically feasible option.

In terms of hardware, the core asymmetry between the North and South today is one of network-centric warfare versus weapons of mass destruction, and at its center lies competition in technological development. Therefore, in order to secure a strategic, long-range NCW system, the South needs to foster national-defense R&D, committing itself to the accumulation of core technology. Furthermore, it must construct a cooperative relationship between the people and the military at a national level.

Responses to Long-Range Artillery and Conventional Missile Threats

The Greater Seoul Metropolitan Area is the heart of the South; its population density is high, and over 70 percent of the nation's wealth is concentrated there.

Meanwhile, military experts assume that the North, while threatening to turn the city into a sea of flames, will in fact attempt to solve its weaknesses in sustainment capabilities by seizing Greater Seoul early on so as to utilize its human and physical resources.

As a matter of defensive deterrence, the ROK must reevaluate and enhance its counterfirepower capabilities in three dimensions. North Korea not only has recently moved its LRA to reverse slopes and concealed it in camouflaged tunnels but has also continued development and production of KN-01/02 short-range missiles.¹⁰ The ROK must be able to strike LRA batteries within ten minutes after they emerge for firing and restrike until they retreat back to their tunnels. Hence, further decreases in the time required for the battle cycle (target identification, command and control, precision strike) at a joint level are unavoidable.

In terms of offensive deterrence, the ROK must secure capabilities to launch precision strikes against Pyongyang in response to threats to Seoul. Although the range of conventional weapons in the past was insufficient, Seoul is now able to acquire large quantities of various guided weapons that can reach Pyongyang. With such weapons, it can develop effective, simultaneous, and integrated tactics for parallel warfare tactics and decapitation directly threatening the Pyongyang national command. Pyongyang strike assets were once categorized as strategic; now they have become tactical. The relative geographical distances of Seoul and Pyongyang from the armistice line have been made irrelevant by long-range weapon systems.

A proactive defensive readiness posture that combines the above defensive and offensive deterrent measures is urgently needed.¹¹ As the South's population has increasingly become concentrated in Seoul, the city's strategic value has grown. The people, for whom the value of life and property has increased in proportion to the nation's economic and social development, demand the strengthening of national security.¹² Further, Greater Seoul has recently expanded northward; the distance from the demilitarized zone has decreased from between thirty and forty kilometers to between fifteen and twenty, and this trend is expected to continue in the future. This newly urbanized region was originally an operation area for frontal corps; it has become imperative that these units hold the current front without conceding territory.¹³

In order to achieve a state of proactive defense readiness, the ROK must be able to manage Greater Seoul's resources in multidimensional respects. Otherwise it will be merely a burden and obstacle for ROK forces and a crucial strategic resource for the North Koreans. The South must convert Greater Seoul's proximity to the front line from an asymmetric weakness into a strategic advantage by organizing and husbanding its human and material resources so that they can be, when necessary, rapidly converted into powerful, forward-deployed combat

units. Therefore, South Korea must implement a rapid Greater Seoul mobilization plan that, while minimizing the burden on the people, can nevertheless be activated in case of imminent threats. It is important that the ROK review its current reserve-force and industrial mobilization programs and bring them to levels matching those of the United States and Israel.

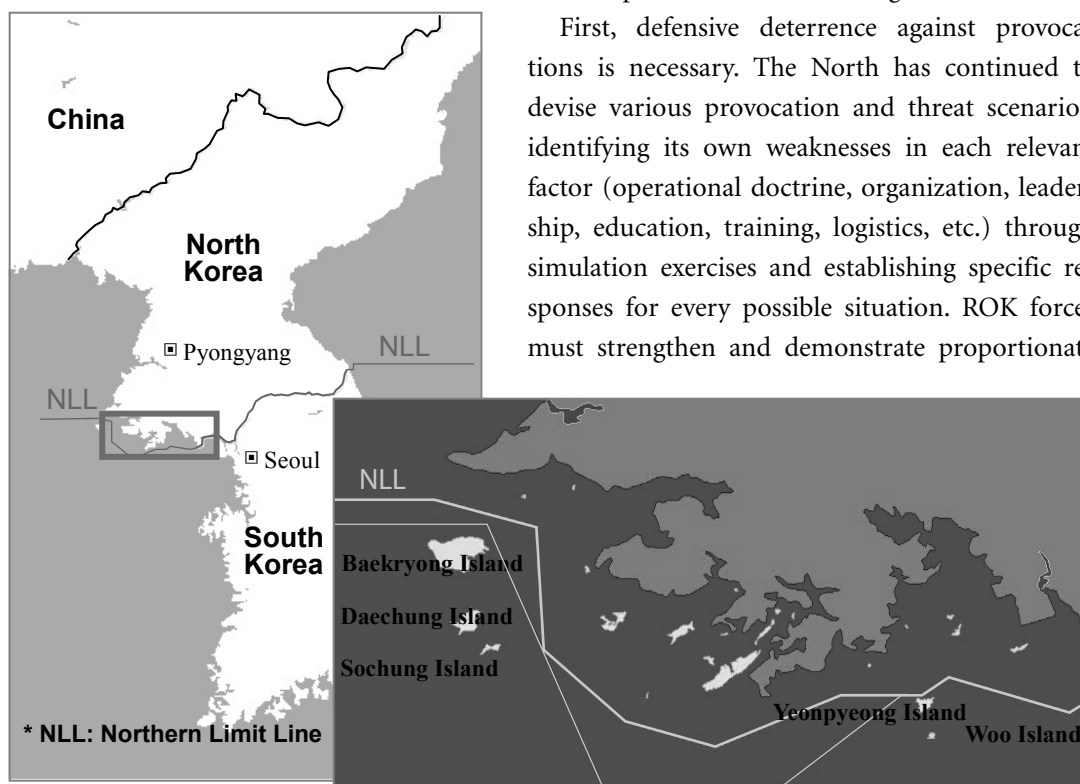
Responses to Threats to the “Five West Sea Islands”

The North’s recent provocations against Yeonpyeong Island demonstrated how vulnerable the Five West Sea Islands are. In fact, however, the Five West Sea Islands represent a geographic asymmetric disadvantage for the North, which hence may consider them a serious strategic threat.¹⁴ In fact, the South, by positioning forces forwardly on the islands and in the surrounding waters, can, during peacetime, impose a strategic blockade (serving to protect Greater Seoul) around the coasts of Hwanghae Province (one of the nearest land provinces from the Northern Limit Line [NLL] in North Korea). In wartime, the South can prevent sudden infiltration of Greater Seoul through the coastal region and can also strike western North Korea. Military strategists anticipate that the North will continue to monitor the strategic situation on the Korean Peninsula and contrive new methods to offset the NLL. At the current stage, thorough preparation and defense of the

West Sea NLL and the Five Islands—the front lines of the Republic of Korea—are urgent.

First, defensive deterrence against provocations is necessary. The North has continued to devise various provocation and threat scenarios, identifying its own weaknesses in each relevant factor (operational doctrine, organization, leadership, education, training, logistics, etc.) through simulation exercises and establishing specific responses for every possible situation. ROK forces must strengthen and demonstrate proportionate

NLL AND THE FIVE WEST SEA ISLANDS



retaliatory capabilities in order to deter North Korean provocations effectively. It appears that the North will now reduce provocations against vessels at sea, but the South must remain vigilant as intelligence shows the North's ambition of developing and deploying, in collaboration with Iran, new "patrol killer" craft and submarines equipped with stealth technology. Seoul expects further provocations using submarines and remains highly sensitive to mixed provocations, such as those from both artillery and antiship/land-attack missiles. Therefore, a thorough review of naval and marine forces required for proportional retaliation against various types of provocations from the North is necessary at a joint level, along with accurate forecasting.¹⁵ With regard to the possibility of the North developing stealth patrol killers and small submarines, the need for further R&D is urgent.

Next, with respect to provocation deterrence, it is necessary to develop and examine scenarios requiring various types of proportional retaliation, assessing whether the ROK should not respond in certain situations, so as to avoid escalation, while at the same time providing active support, and to accumulate "combat" experience through simulation exercises. Furthermore, the ROK must consider hypothetical situations in which the North provokes the South with a combination of various methods, and the ROK must also prepare for proportional retaliation along valid lines of self-defense.

Additionally, the South should also examine deterrence measures against offensive actions—that is, more serious provocations. The Five West Sea Islands are highly vulnerable now, but should the South convert them into unconquerable fortresses, their vulnerability could become a strategic advantage due to their closeness to the North. Baekryong Island, from the North's perspective, is similar to Taiwan's Jinmen Dao (Quemoy Island) (金門島) in China's eyes in the years of tension and confrontation in the Taiwan Strait. Jinmen's strategic value has long since dissipated, but Baekryong, the ROK's eighth-largest island and the country's northernmost territory, 180 kilometers from Incheon City, lies only twenty-nine kilometers from North Korea's Hwanghae Province and 150 kilometers from Pyongyang, as shown in the map. For its part, Jinmen Dao, 250 kilometers from Taiwan but less than ten from mainland China, was originally in a weaker position than Baekryong, but Taiwan was able to transform it into a strategic fortress that defended itself against 470,000 artillery shells fired on it from 23 August to 5 October 1958. It is now a tourist site, governed by its people.¹⁶ If Seoul is able to do the same with Baekryong and the other West Sea Islands, they will deter North Korean violations of the NLL and, if necessary, threaten the North's middle region. Moreover, the islands will compel the North to reposition frontal forces to the rear areas, in effect deterring North Korean threats of turning Seoul into a sea of flames.

Responses to Special Operations (Light Infantry) Threats

North Korea is known to possess superior irregular-warfare capabilities (special operation, mountain, night, and depth-infiltration warfare, etc.) and to combine them effectively with regular-warfare tactics. Moreover, it has recently greatly increased its light infantry units;¹⁷ intelligence shows that the North has increased its special warfare force to approximately two hundred thousand men, apparently intended to execute guerrilla-type depth infiltration warfare by exploiting the weaknesses of high-tech forces in mountainous regions. In order to counter such asymmetric threats, the South must consider two measures—defensive and offensive.

With regard to defensive counter-asymmetric measures in this area, the ROK must develop night-surveillance, reconnaissance, and identification equipment, along with night-targeting and precision-strike weapons, in order to “light up the night.” Scientists have noted that current technology is sufficient for this purpose. Moreover, with aerial surveillance and reinforcement and unmanned air reconnaissance methods, as well as helicopter-based mobility and strike, the ROK will be able to “flatten the mountains.” Considering the lack of resources, the South should strongly consider prioritizing aerial methods and decreasing procurement of tanks and other ground mobility and strike forces.

Next, the ROK must bolster its mobile reserves and homeland defense systems. As previously stated, the South must actively prepare against rear infiltration by the North’s frontal units by upgrading various reserve divisions to match the standards of standing forces. The South must establish a counter-infiltration operation system, with a combined effort from civil society, government, and the military, to improve major current vulnerabilities. This system would review countermeasures and strengthen weaknesses against not only ground but also underground, aerial, and sea/underwater infiltration. The South should especially apply lessons learned from the ROKS *Cheonan* and Yeonpyeong Island shelling incidents and prepare forces and operational concepts to effectively counter underwater infiltration attempts, and, moreover, develop its capabilities against submarines as well as against small, high-speed, stealth patrol killers. The ROK forces must perceive North Korean infiltration capabilities as asymmetric assets no less dangerous than WMDs, and should continuously review, supplement, and develop counter-infiltration measures (policy, strategy, doctrine, weapons/equipment, organization, exercises, support, etc.) in various aspects at a joint operational level.

The ROK can also sharply improve its own depth-infiltration special-operation capabilities by capitalizing on the strengths of a “net-centric operational environment” (NCOE). Today, most advanced military powers are actively utilizing the nonlinear decentralization capabilities offered by NCOE for unconventional

warfare. NCOE has continuously expanded the purpose and range of special operations at a strategic level, by virtue of the ability it gives units to be deployed in enemy territory and carry out their missions while maintaining close network connections with friendly forces and rear services.¹⁸ These special operation forces will not only become a strategic liability to the North itself but also restrain and deter enemy infiltration attempts and play an indispensable role in achieving victory in war. An organic combination of NCOE, “blitz” warfare by regular ground and air forces, and special forces could produce a counter-asymmetric force far superior to North Korea’s regular-irregular/mixed-warfare tactics.¹⁹

Responses to Cyberwarfare Threats

North Korea’s cyberwarfare should not be ignored. The North perceives cyberwarfare tactics to be as important as WMDs and has concentrated on their development.²⁰ The regime selects young students of ages twelve and thirteen, enrolls them in computer courses for the gifted at the First and Second Geumseong Senior-Middle Schools, and then matriculates them in either Kim Il-sung University or the Command Automation University (formerly known as Mirim University) after graduation. The Command Automation University selects around a hundred talented students for an intensive five-year course and then sends graduates to cyber-related institutions and military units. Also, as illustrated in table 2, the 121st Unit, originally under the Korean People’s Army General Staff Reconnaissance Bureau, was reorganized in 2008 into technical reconnaissance teams, with a mission that includes infiltrating computer networks, hacking secret information, and planting viruses to paralyze enemy networks. Other such organizations—the 204th Unit, under the Operations Department of the Unification Bureau, and the Psychological Operations Department of the North Korea Defense Commission—are primarily focused on cyber-psychological warfare.

North Korea is known to operate and manage directly websites—for instance, *The North Korea Official Page*, in collaboration with pro-North and civil organizations within the South—that execute psychological warfare and organized espionage.²¹ According to a report submitted to parliament by the National Police Agency in September 2008, the agency had by that date blocked forty-two foreign-based, pro-North websites out of a total of seventy-two that propagandize *juche* ideology and the North’s unique socialist state while at the same time inciting anti-South and anti-American sentiments. North Korea has also utilized websites operated by sympathizing parties in order to initiate espionage. By the end of 2008 North Korea possessed twenty-four websites, including “Gugukjeonseon” (구국전선), and the numbers continue to increase. Recently, pro-North civil organizations digitized posters and leaflets used in the 1980s by activist students and uploaded them to their websites, where they have been highly effective.²²

TABLE 2
CYBER- AND CYBER-PSYCHOLOGICAL WARFARE UNIT

Institution/Unit	Composition	Mission and Activities
121st Unit (Intelligence Bureau)	Approx. 300 persons, 10 combat teams, 110 research teams	Hacking, virus-planting in military units related to cyberwarfare
Central Party Investigative Group	Approx. 500 persons, 10 technical teams	Technical education and training
Unification Bureau Operations Department	50 persons	Cyber-psychological warfare, organizational espionage
204th Unit (Operations Department, of the Unification Bureau)	Approx. 100 persons, 5 espionage teams	Cyber-psychological warfare planning, execution, and research on techniques and technology

The South's security will be seriously threatened should it lose the battle to control cyberspace. However, it has not been easy to devise innovative counter-strategies, because of the special conditions of cyberspace and the substantial investment and effort required. The best policy available at this point is, first, to upgrade, as a strategic matter, the ROK Cyber Command, established in early 2010. This command will open the way for cooperation among existing national cyberwarfare institutions and for collaboration in new policies and connections. It can also formulate a system that will enable cyberwarfare operations led by the military in time of war; connect and conduct integrated intelligence and regular operations; and design an overall cyberwarfare structure, including the concepts, doctrine, requirements, education, and training methods needed for the command to operate effectively.

Countermeasures at the government level are also necessary. The Republic of Korea is an information-technology powerhouse. Its world-class "cyber genius-es," technological abilities, investment capital, and infrastructure make it asymmetrically superior to the North. The problem lies with the government's lack of effort and will to organize and systemize such potential for effective use in the field of national security. It is urgent that we resolve such an ironic contradiction. At a policy level, solutions may include establishing norms for the cyber realm, obliging real-name usage, creating a cyber "shinmungo" (신문고, a big drum that was struck by petitioners against the government during the Joseon dynasty, 1392–1897) to allow the people to report suspicious activities, formulating a voluntary cyber reserve force and a mobile civil-defense unit, commending regions that have greatly contributed to cyber protection, and holding cyber-protection technology competitions.

Furthermore, the ROK must establish and strengthen legal and systematic devices that can block North Korea's unusual cyber-infiltration tactics and sever its

connections with sympathizers within the South. Although it is important that the government protect its citizens' freedom in cyberspace, irresponsible, antisocial, and antinational behavior must be constrained. Cyberspace has now become the fifth battlefield, where an important "nonwar" must be fought and victory won through a "minimal damage" strategy.²³

Responses to High-Technology Threats

Along with its nuclear weapons and missiles, North Korea is also developing high technology relevant to conventional weapons. Electromagnetic-pulse, GPS-disturbance, stealth technologies represent a few of its latest asymmetric programs intended to offset the South's developing NCW forces by targeting its weaknesses.

The 2008 ROK national defense white paper stressed that North Korea has developed various GPS-disturbance and deception devices and was contemplating measures against precision-guided weapons.²⁴ It has been discovered that the North attempted to export to Iran, Syria, and other Middle East nations GPS-disturbance devices that can jam high-tech missiles and precision-guided bombs; in May 2010, ROK government officials discovered in a North Korean weapon export catalogue information indicating that the CHT-02D, the type of torpedo that sank ROKS *Cheonan*, contained a GPS-disturbance device.

The situation may further deteriorate if North Korean jamming devices are, or will be, able to affect the ROK's precision-guided weapons, such as the Joint Direct Attack Munition (JDAM), its wind-corrected munition dispenser, and other systems intended to counter long-range artillery threats against Greater Seoul.²⁵ In the second Gulf War in 2003, there were cases in which the Iraqi army deployed Russian GPS-disturbance devices against U.S. precision-guided weapons, resulting in ineffectual explosions. The National Defense and Science Institute has reportedly invested a great deal of ROK currency—more than forty billion won—over the past six years to develop a Korean guided-glide weapon, the Korean GPS-Guided Bomb, which is known to perform better than JDAM.²⁶ Its range is from seventy to a hundred kilometers (JDAM's current range is twenty kilometers) and can accurately target underground LRA tunnels with entrances less than three meters across (ten meters for JDAM) from a safe distance. The successful development of the Korean GPS-Guided Bomb is indeed good news and will greatly contribute to national security, but adequate countermeasures against North Korean GPS jamming are still pending and continue to require scientific and technological effort.

A recent article stated that North Korea has developed and employed stealth and camouflage technologies.²⁷ It reported that an exclusively obtained, eighty-page North Korean military manual on electronic warfare explained various camouflage and deception methods in detail, such as that radar-wave-absorption paint of 1.4

to 1.8 mm thickness achieves a wave-absorption rate of 95 percent for three to five years. This manual suggests that anti-wave and anti-infrared paint has been applied to the entrances of LRA tunnels, obtaining an absorption rate of 99.8 percent of radio waves and 99.9 percent of infrared. Further, the manual is reported as stating that fake tunnel entrances have been created about 150 to 300 meters away from the real ones, with nearby angled reflectors to draw enemy radar. The manual also includes graphs that analyze differences in facility concealment from various distances and heights (such as the twelve-kilometer flight altitude of the U.S. Army's RC-135 and ROK Army's Hawk 800XP) and suggests that the ROK's ground-surveillance radars deployed in the frontal region can be deceived by walking at less than one kilometer per hour at five-meter intervals.

North Korea has also developed small stealth submarines. In May 2005, Iran publicly announced the production of its first domestically produced submarine, "a craft capable of operating stealthily."²⁸ Witnesses have judged that this submarine, which the Iranian Ministry of Defense and Armed Forces Logistics calls *Ghadir*, is similar in appearance to the North Korean *Yugo* (유고) class; other experts believe that *Ghadir* is about 50 percent longer than the *Yugo* class and therefore is more like the North Korean *Sang-o* (상어, "Shark") class. On 8 August 2010, Agence France-Presse and the Associated Press reported that the Iranian navy had launched four domestically produced small submarines, of the "*Ghadi* [*sic*]" class, that were based on the North Korean *Yeon-o* (연어, "Salmon") type, and possessed stealth features enabling them to evade sonar and sonobuoys.²⁹

The Persian Gulf is shallow, with an average depth of twenty-five meters and a maximum of 170. The West Sea (or Yellow Sea, west of the Korean Peninsula) has an average depth of forty-five meters and a maximum of a hundred. This similarity of numbers, against the background of the torpedoing of ROKS *Cheonan*, seems profoundly significant. Bruce Bechtol, an American expert on the Korean Peninsula, has stated that "North Korean *Yugo*-class submarines may become a potential threat to the South in the West Sea area since they are able to operate in shallow waters" and that "the North Korean submarines provided to Iran are most likely *Yugo* class."³⁰ From such opinions and statements of experts, we can surmise that the Iranian *Ghadir* submarine is based on the same prototype as North Korea's newly developed submarine that operates off the Nampo Naval Base in the West Sea.

A TURNING POINT

Despite its severe economic crisis, the North has managed to develop nuclear weapons and missile technologies and conduct pioneering research on the means to counter the South's network-centric warfare assets. The North has

astutely selected and concentrated on low-cost weapons and assets that can effectively penetrate the South. A strategy to counter these asymmetric threats is needed, and the answer is to both develop high-tech NCW assets and maintain superiority in counterstealth, counter-submarine, counterelectronic, and counter-cyberwarfare capabilities. The Republic of Korea possesses all the resources and capabilities required. What the ROK needs, and urgently, is an understanding of its situation and a collective will to solve its problems and push forward with its plans.

Today, the two nations on the Korean Peninsula compete under different ideologies, government systems, and strategies. South Korea, with its superior national power, strives to achieve an asymmetric superiority based on high-tech, networked forces, assets of superior quality, and a robust alliance with the United States—its core asymmetric factor. Meanwhile, the North, in severe economic crisis and suffering the effects of a hereditary dictatorship, pursues quantitative superiority along with a focus on nuclear and other weapons of mass destruction, as well as on tactical asymmetric measures that exploit the South's weaknesses.

Until now, the North has consistently aspired to achieve an armed reunification of the two Koreas. However, against South Korea, a nation boasting a thriving economy thirty times greater than its own and a superpower ally, the North had no choice but to complement its conventional warfare doctrine with asymmetric concepts. The North Korean underground tunnels, tunnel bases, mixed warfare, infiltration tactics, long-range artillery, nuclear weapons, CBR weapons, missiles, GPS disturbance, stealth, small submarines (like that which torpedoed ROKS *Cheonan*), and other assets yet unknown are all examples of the North's asymmetric strategy and methods.

Our ancestors applied the “porcupine strategy,” “*yiyijaeyi*,” and “*yisojaedae*” as examples of what we now call asymmetric strategies. The great commander Admiral Yi Sun Shin invented the “turtle ship” and the “crane wing formation” and employed them successfully in battle during the Japanese invasions of 1592 and 1597.³¹ As his proud descendants, it is time for the citizens of the Republic of Korea to shift to a new paradigm, reassess the strengths and weaknesses of their national defense, and develop counter-asymmetry strategies against the North. Like the attacks of 9/11 against the United States, the tragic sinking of ROKS *Cheonan* and the shelling of Yeonpyong Island must together mark a turning point in the history of the South's national defense.

The policy directions suggested here call for an increase in the national defense budget, the cooperation and coordination of the people, and determination in the political sphere. The words of the Roman strategist Vegetius, *Si vis pacem, para bellum*—should you desire peace, prepare for war—are still valid today.

NOTES

- The opinions in this article are the personal views of the author and do not necessarily reflect the policies and strategies of the ROK Ministry of National Defense, Joint Chiefs of Staff, armed forces, or government. Additionally, this article does not reflect the position of the U.S. government.
1. North Korea's torpedoing of ROKS *Cheonan* and bombing of Yeonpyeong Island can be understood as efforts to create achievements for Kim Jung-eun (the apparent prospective successor to Kim Jong-il); to induce direct, bilateral North Korean-U.S. talks and resumption of Six Party Talks; and to elicit support from China. See 조성율 [Cho Seung Ryul], "북한의 연평도 포격도발 및 한반도 미래 전망" [Intentions behind North Korea's Bombardment of Yeonpyeong Island and Future Prospects on the Korean Peninsula] (a paper presented at Korea Institute for Maritime Strategy [KIMS]-Research Institute for Maritime Strategy [RIMS] seminar, 9 December 2010, Seoul), pp. 9-14.
 2. At this writing it is expected that North Korea will complete a base for hovercraft and stealth air-cushion warships at Koampo, Hwanghae Province, only fifty kilometers from the South's northwestern islands, in December 2011. See "Stealth Hovercraft Armada Poised to Invade South Korea," 31 May 2011, available at www.lucianne.com/; and 윤성원 [Yoon Sung Won], "NLL 인접 북한 고암포 해군기지 완공 단계" [Construction of Koampo Naval Base near NLL Nearing Completion], 29 May 2011, available at www.asiatoday.com.kr/.
 3. 이윤규 [Lee Yoon Kyu], "북한의 사이버 심리전 실체와 대응방안" [The Essence of North Korea's Cyber-Psychological Warfare and Appropriate Counter-measures], 육군 [The Army, monthly magazine], August 2009, pp. 1-6. North Korea pursues a hybrid concept involving preemptive surprise attacks and lightning, combined-arms warfare combining regular and irregular forces, cyber- and psychological warfare, terrorism, etc., to offset its technological inferiority against conventional ROK-U.S. forces.
 4. "Juche" [주체], or the "juche ideology" [주체사상], is an ideology of national "self-reliance," developed in the Kim Il-sung era and now used as the theoretical foundation of the regime; see www.globalsecurity.org/, s.v. "Juche [주체, Self-Reliance or Self-Dependence]."
 5. 남만권 [Nam Man Kwon], "최근 화생무기 현안의 문제점과 우리의 과제" [Current Issues and Tasks on the Latest CBR Weapons], *Korea Institute for Defense Analyses Weekly*, 29 May 2000.
 6. In 2010, according to a comparison of flight time, South Korean fighter pilots flew about 140 hours and North Korean pilots less than ten.
 7. Song Sang-ho, "ROKS *Cheonan* Sinking Reshapes Military Strategies," *Korea Herald*, 21 March 2011, pp. 4 and 15.
 8. 변창섭 [Chang Sup Byun] and Bruce Bechtol, "북한, 기존의 국가체제론 변화 어렵다" [Change Expected to Be Difficult for North Korea under Current Regime], 내가 보는 북한-30 [My View of North Korea-30], *Radio Free Asia*, 11 August 2010, available at www.rfa.org/. They offered several reasons for North Korea's nuclear program. First, because North Korea can attain high military status by possessing nuclear weapons, Kim Jong-il is developing them as a means to maintain his own power. Second, they argue, the North Korean regime is believed to have received at least two billion dollars from Syria for plutonium, and a substantial amount of diesel fuel as well as petroleum from Iran for cooperating with that nation's highly enriched uranium program. Lastly, North Korea desires highly enriched uranium and plutonium weapons as a deterrent or offensive weapon against the ROK-U.S. alliance and Japan.
 9. National plans refer to required core assets in terms of stages. The first stage is surveillance and control, including multipurpose satellites, high-altitude unmanned reconnaissance aircraft (Global Hawk), early-warning radar for ballistic guided missiles, early-warning control aircraft (E-737), and a combined firepower-employment system (JOFOS-K). The second is precision strike: combined long-range attack missiles (JASSM), direct precision missiles (JDAM), and bunker busters (BGU-28). The third stage, interception,

- involves air-defense missile control centers (ADM-Cell), surface interception guided missiles (SM-6), and ground-based Patriot missiles (PAC-II/III). The fourth stage is nuclear protection: EMP defense systems and individual/unit defenses.
10. 유용원 [Yoo Yong Won], “북한군 비밀교범 단독입수: 북한 위장 전술, 레이저 전파까지 흡수한다” [Exclusive Obtainment of Confidential North Korean Military Manual: North Korean Camouflage Tactics Able to Absorb Radar Waves], *조선일보* [Chosun Ilbo], 23 August 2010, available at news.chosun.com/. Recently, North Korea has developed and deployed enhanced Scud missiles, along with the new KN-01 ground-to-surface missile and KN-02 ground-to-ground missile. Replacing the outdated Chinese Silkworm (with a range of 83–95 kilometers and vacuum-tube circuitry), the KN-01 ranges 120–160 kilometers and has improved accuracy. The short-range (120 kilometers) KN-02 uses solid fuel, is mobile, has an accuracy (circular error probable) of a hundred to two hundred meters, and can be launched within five minutes.
 11. 권태영 [Kwon Tae Young] and 노훈 [Roh Hoon], *21세기 군사혁신과 미래전* [21st Century Military Reform and Future Warfare] (Seoul: 법문사 [Beobmusa], 2008), pp. 361–62.
 12. The ROK Ministry of National Defense (MND), *한국적 군사혁신의 비전과 방책* [Visions and Measures of Korean Military Reforms] (Seoul: ROK MND, 2003), p. 30. In 2030, South Korea’s economy is expected to be placed among the “G7” industrialized nations and its information index to enter the “G5” (meaning advanced countries in terms of information technology, including the United States, Japan, the People’s Republic of China, and the EU).
 13. 김정익 [Kim Jung Ik], “미래 합동작전에서 지상군의 중심적 역할” [The Central Role of Ground Forces in Future Combined Operations], in Korea Research Institute for Strategy (KRIS), 2008년 육군전투발전: 대전환기 정예화 선진육군의 비전과 전략 [2008 Army Combat Development: Visions and Strategies for an Advanced Elite Army during Times of Transition] (Seoul: KRIS, September 2008), pp. 491–92 and 525.
 14. As shown in the map, the five islands are Baekryong Do, Daechung Do, Sochung Do, Yeonpyeong Do, and Woo Do. “Do” [도] means “island” (for example, Yeonpyeong Do is Yeonpyeong Island).
 15. Jung Sung-ki, “S. Korean Navy to Boost Precision Weapons and Surveillance Aircraft,” *Defense News*, 10 January 2011, pp. 11–12.
 16. On the second Taiwan Strait crisis and Jinmen (Quemoy) and Mazu (Matsu) Islands, see “Second Taiwan Strait Crisis Quemoy and Matsu Islands 12 August 1958–01 January 1959,” available at www.globalsecurity.org/.
 17. North Korea has reorganized its frontal corps structure, increasing its light infantry divisions and elevating infantry battalions to regiments.
 18. This tactic involves employment of special units against strategic targets deep in enemy territory to radiate them with directed-energy weapons and target them with long-range precision weapons launched from the land, sea, and air. Success requires high confidence of air supremacy and real-time precision strike support.
 19. 권태영 [Kwon Tae Young], *육군비전 2030 연구* [Research on Army Vision 2030 Research] (Seoul: KRIS, November 2009), pp. 298–302.
 20. On 7 July 2009 and 4 March 2011, South Korea and the United States suffered concentrated DDOS cyber attacks; because North Korea was identified as the source of these attacks, experts began to reevaluate North Korea’s cyberwarfare capabilities. North Korea currently operates technical reconnaissance teams consisting of approximately a thousand members under the People’s Army General Staff Reconnaissance Bureau; professional North Korean hackers have usually been placed in China, from where they continuously attempt to hack the internet sites of major South Korean government institutions.
 21. *The North Korea Official Page*, available at www.korea-dpr.com; Gugukjeonseon [국국전선], available at www.ndfsk.dynds.org.
 22. Lee, “The Essence of North Korea’s Cyber-Psychological Warfare and Appropriate Counter-measures.”

23. Conventionally speaking, first-generation warfare is the destruction of enemy forces in nearby areas through concentrated fires (e.g., the Napoleonic Wars); second-generation warfare is the destruction of enemy forces located farther away through concentrated fires (i.e., artillery) (e.g., the First World War); and third-generation warfare is characterized by short-term maneuver battles involving “shock and awe” tactics. Fourth-generation warfare is political conflict in which available asymmetric tools of warfare are utilized to defeat the enemy resolve to carry on the fight (e.g., Mao Zedong’s People’s War against the Kuomintang, the Vietnam War, etc.). In the fifth generation, attacks are launched to weaken enemy soft power. For more details, Andrew Mack, “Why Big Nations Lose Small Wars,” *World Politics* 27, no. 2 (January 1975), pp. 175–200; New Military Paradigm, 제4세대전쟁 [Fourth-Generation Warfare] (Seoul: 집문당 [Jimmundang], 2010); 전종순 [Jun Chong Soon], “전쟁없는 전쟁: 제4세대전쟁” [Fourth Generation: Warfare without Warfare], *군사연구* [Military History Studies], no. 125 (August 2008); and 양욱 [Yang Wook], “제4세대 전쟁: 한국의 대비책은?” [Fourth-Generation Warfare: What Is the ROK’s Preparation?], *시사저널* [Sisa Journal], no. 1108 (12 January 2011), available at www.sisapress.com/.
24. ROK MND, *Defense White Paper 2008* (Seoul: ROK MND, 2008), p. 27.
25. “북한 장사정포대에 대한 공격은 GPS 방해시 어렵다” [Precision Strike of North Korean Long-Range Artillery May Be Difficult When GPS Is Disrupted], 16 October 2006, available at www.dailynk.com/; 고광섭 [Ko Kwang Sup], “만약 한국의 GPS 항해 신호가 불가능하게 된다면” [If It Becomes Impossible to Use GPS Navigation Signals], *국방일보* [Kookbang Ilbo], 10 October 2008. North Korea has attempted to export its GPS-jamming devices, which are enhanced versions of Russian models, to Middle East nations, including Iran and Syria. The South is correcting this shortfall with a wind-compensated munition dispenser that uses inertial guidance only; it includes the CBU-87 combined effects munition, CBU-99 Gator antitank/antipersonnel mine, and CBU-97 sensor fused weapon. See “Wind Corrected Munition Dispenser (WCMD),” *FAS Military Analysis Network*, available at www.fas.org/.
26. 안성규 [Ahn Sung-kyu] and 김병기 [Kim Byung-ki], “산 뒤 숨긴 북한 장사정포 잡는 한국형 JDAM 개발” [Development of Korean JDAMs That Can Destroy North Korean Long-Range Artillery Hidden behind Mountains], *중앙선데이* [JoongAng Sunday], 29 August 2010.
27. Yoo, “Exclusive Obtainment of Confidential North Korean Military Manual.”
28. 김필재 [Kim Pil Jae], “북한과 이란의 슈퍼 어뢰를 가진 스텔스 잠수함 협력” [North Korea–Iran Connections Regarding Stealth Submarine Super Torpedoes], *Independence Newspaper*, 6 April 2010.
29. 이인목 [Lee In Muk], “이란, 북한기술도입해 새로운 잠수함 완성” [Iran Completed New Submarine with North Korean Technology], *조선일보* [Chosun Ilbo], 9 August 2010, available at news.chosun.com/.
30. “북한 어뢰의 남한 해군함정 폭침” [North Korea Torpedo Sinks South’s Navy Ship], *DemocracyForums*, May 2010, available at www.democracyforums.com/.
31. For the turtle ship, see the cover illustration and caption of the Spring 2010 *Naval War College Review* and, for the Japanese invasion, Yoji Koda, “The Emerging Republic of Korea Navy: A Japanese Perspective,” in the same issue (pp. 13–34).

SEEKING BALANCE

Force Projection, Confidence Building, and the Republic of Singapore Navy

Swee Lean Collin Koh

Despite the widespread proliferation of studies on the major navies in Asia, first and foremost that of China, writings on the small navies of Asia—Southeast Asia in particular—have been few and far between. The slant toward those major navies is warranted by their influence on the regional naval balance of power. However, it scarcely does justice to the small navies of Southeast Asia, a region of huge maritime geostrategic importance with potential security ramifications for wider Asian and global maritime security. Southeast Asia is also the scene of an interesting and serious buildup of sophisticated naval capabilities.

This article therefore attempts to redress, at least partially, the dearth of interest in the small navies in Southeast Asia, using the Republic of Singapore Navy (RSN) as a case study. Though a small navy no doubt, the RSN has been one of the most prolific in its accumulation of high-tech capabilities, which in some respects have matched or even surpassed those of some of its counterparts. Even

more interesting, in view of the disproportionate size of Singapore's maritime domain, is how the RSN grew from a small-craft navy to one capable of force projection beyond its immediate littorals within thirty years or so. These factors made a comprehensive study of the RSN pertinent and valuable to the field of regional naval studies. While much of the limited pool of work that has been done on the RSN revolves around capabilities, this article adopts a holistic perspective,

Swee Lean Collin Koh is an associate research fellow at the Military Studies Program, Institute of Defence and Strategic Studies, a constituent unit of the S. Rajaratnam School of International Studies in Nanyang Technological University, Singapore. He is also currently a doctoral candidate at the same institution; his dissertation focuses on naval modernization in the Asia-Pacific, especially Southeast Asia, but also looks at Scandinavian naval developments from the Cold War to the present.

embracing the evolution of its overall posture, Singapore's naval policies, and the navy's force structure and operations. It argues that the RSN has consistently maintained a confidence-building force posture, a posture evident in the increase in both its force-projection capabilities and the scope of its operations. First, this article examines the maritime geostrategic context within which Singapore is situated; this sets the stage for an analysis of the country's naval thinking and policy orientation. The RSN force structure is then discussed, followed by its operations.

THE MARITIME GEOSTRATEGIC CONTEXT OF SINGAPORE

Singapore lies within a unique maritime geostrategic setting, one with a double-edged character in terms of the country's security. On the one hand, its geographical location along the confluence of vital Asian sea lines of communications (SLOCs) in the Straits of Malacca and Singapore makes the country a strategically ideal hub for international seaborne trade and commerce.¹ This factor contributes to no small degree to Singapore's socioeconomic prosperity up to this very day. On the other hand, however, this geostrategic location poses a conundrum for the country's maritime security.

First, as a small island state, Singapore lacks strategic depth for effective defense against determined external aggression; one recalls how quickly the imperial Japanese forces overwhelmed the island state's defenses in February 1942. Also, being surrounded by the sea, the country is heavily dependent on secure access to the SLOCs through which international commerce flows. Their disruption, whether by state or nonstate actors, could bring Singapore's economy to a virtual standstill, with disastrous socioeconomic consequences. Further, and related to SLOC security, Singapore's close proximity to its neighbors presents problems with regard to spillovers of maritime security threats of several kinds. Transnational crimes at sea, including pirate attacks and sea robberies, are an increasing concern not just in Malaysian and Indonesian waters but also in Singapore's. The country's proximity also to potential regional flash points—such as the Indonesian-Malaysian dispute over the Ambalat block and its oil and natural-gas reserves in the Sulawesi (or Celebes) Sea and, more notoriously, the multilateral dispute in the South China Sea—presents yet another dimension of risk to Singapore's maritime security.

History too plays an important role in Singapore's complex geostrategic context. The country does not exercise authority over broad swaths of seas as its neighbors do. Theoretically, Singapore has only 150 kilometers of coastline and three nautical miles of territorial waters, though the Ministry of Foreign Affairs has since 1980 claimed twelve nautical miles of territorial waters and an exclusive economic zone (EEZ), a claim that it repeated after winning sovereignty in

May 2008 over Pedra Branca, a rocky outcrop contested with Malaysia in the easternmost outlet of the Straits of Johor into the South China Sea.²

Ultimately, whether Singapore can exercise its maritime claims is highly dependent on Indonesia and Malaysia, with whom the island city-state has had historically complex relations. With Malaysia, Singapore occasionally had squabbles over customs, immigration, and quarantine issues; water supply; and Pedra Branca. These three sources of animosity are left over from the breakaway of Singapore from the Federation of Malaysia. For its part, Indonesia in the 1960s, under President Sukarno's regime, carried out acts of aggression against its Southeast Asian neighbors. While the most intense combat of this *konfrontasi*, as it was known, occurred in Borneo, Singapore was not spared, being victimized by Indonesian terror attacks. As a result of all this, despite warming of relations, to this day Singapore is subjected at times to rhetorical assaults by Malaysian and Indonesian political leaders over such issues as airspace infringement and perceived lack of sensitivity on the part of Singapore's leaders. This attitude dates to the 1960s and 1970s, when the island state was widely regarded as a carbon copy of Israel within the Muslim seas, an image reinforced by what was seen as a "do or die," unilateralist attitude of Singapore's policy makers, especially in defense matters.³

Geostrategic context thus dictates the manner in which Singapore perceives its security, and in turn, the maritime dimension dominates Singapore's security planning. Two key aspects of Singapore's maritime security arise from the country's geostrategic context: seaward defense against external maritime aggression and the safeguarding of sea lines of communications. These factors are pivotal for Singapore's continued survival and prosperity. Until the turn of the twenty-first century, seaward defense and SLOC security in the immediate Southeast Asian littorals could be regarded as the sole *raison d'être* of the Republic of Singapore Navy. This remains largely true (though the threat of a major war has subsided), but with the end of the Cold War and the terrorist attacks of 2001, a new dimension has been added—that newly emergent threats far away may have ramifications for national security.⁴

The Singapore Armed Forces (SAF) have a long history of participating in international security operations, such as dispatching military observers to United Nations peacekeeping duties abroad. But the RSN itself did not, until the beginning of the present century, venture far beyond the region in such missions. Today, however, in support of Singapore's foreign policy of fulfilling its obligations as a responsible citizen of the international community, the RSN serves as a viable, flexible instrument of diplomacy and widens the scope of SAF participation in international security operations.⁵ To be sure, such commitments are calibrated and selective, highly sensitive to the security priorities of and constraints

on Singapore's defense planners. For instance, the RSN's involvements in the northern Arabian Gulf in 2003 and Gulf of Aden in 2009 reflected the major ramifications for Singapore's security of those faraway regions. Accordingly, this new dimension of Singapore's maritime security should not be exaggerated; in 2010, then–defense minister Teo Chee Hean remarked that the SAF's preoccupation remains with national defense and security.⁶

In sum, then, while Singapore's maritime security perceptions have broadened beyond the immediate Southeast Asian and even the Pacific Rim, its security focus remains primarily local. This posture is reflected in the evolution of the RSN's force structure and operations, as later discussion will show. However, it is first necessary to explore the impact of Singapore's maritime geostrategic context on its naval concepts.

SINGAPORE'S NAVAL THINKING AND POLICY

Geostrategic circumstances define a set of priorities for Singapore's defense planning, not the least with respect to overall force posture. No official document released by the Singapore government outlines how the country perceives its maritime security circumstances, how its force structure is to evolve, and how operations are to further the aims of policy. The RSN itself has released important material for public viewing, such as a yearbook in 2007, in print, e-book format, and online, and an official website.⁷ The quality and depth of information offered by these sources are far from what can be found in the elaborate maritime policy documents released by the Australian, Indian, and U.S. governments. Nonetheless, they are not simply public relations exercises; together with press releases and interviews with naval planners, they offer a glimpse into this tiny force and serve to promote confidence. Fortunately, analysts interested in the RSN may also rely on the announced overall policy of the Ministry of Defence, inferring from it the navy's priorities and policies. This approach is justified by the fact that the RSN traditionally works within the SAF triservice doctrine (army, air force, and navy) and accordingly adheres closely to the general policy.

According to the only defense white paper published by the government to date, in 2000, two *Ds* are the cornerstones of Singapore's defense policy—deterrence and diplomacy.⁸ These are the twin pillars of RSN policies.⁹ However, underlying them is a set of priorities implied by the country's maritime geostrategic context; these priorities are, from the most to least important, SLOC protection, seaward defense, and international security.¹⁰ Within these three maritime security priorities operates an interplay of deterrence and diplomacy. SLOC security is deemed to be the topmost priority in recent years due to the increased salience of peacetime nonstate threats to maritime security. The Straits of Malacca and

Singapore represent the primary area of responsibility, as far as SLOC protection is concerned. In the South China Sea, other than such nonstate issues as piracy and sea robbery, the threat to SLOCs is posed by militarized actions of claimants in the Spratly Islands dispute. Seaward defense is ranked second, though in the early years of Singapore's independence it was probably most important, because since the end of the Cold War the threat of outright interstate military aggression has been reduced. Nonetheless, the Iraqi invasion of Kuwait in 1990 left a deep imprint in the minds of Singapore's defense planners, exposing this nation's geostrategic vulnerabilities.¹¹ Therefore the defense of the sovereign and territorial integrity of Singapore remains a vital task for the armed forces, and the only option for the SAF, in turn, is a forward posture, manifested as seaward defense, beyond Singapore's immediate waters, by the RSN. International security missions, though a facet of the RSN's operational scope, are the lowest priority of the three, for reasons discussed earlier.

From these maritime security priorities and from organizational history of Singapore's armed forces and navy a set of policies for the RSN has emerged. Prior to the end of the Cold War, seaward defense and SLOC protection were primary missions for the RSN, but until the 1980s the SAF had been mainly concerned with strengthening the army and building up air defenses. The RSN was the funding "stepchild," which limited its procurements and operations. The RSN's approach to seaward defense back then was sea denial; its ability to extend SLOC protection beyond the Strait of Singapore was greatly constrained by the forces it had.

After the Cold War, with the arrival of new capabilities and a shift of orientation toward maritime defense and naval modernization, all underpinned by Singapore's economic growth, the RSN's capabilities were expanded. It could now reach out beyond the Strait of Singapore and make the whole Straits of Malacca and Singapore (SOMS) zone a primary area of responsibility. In particular, the introduction of longer-range naval platforms—missile corvettes—in the early 1990s gave the RSN the ability for the first time to extend its presence into the Strait of Malacca to the west and, to the east, the South China Sea. In fact, by that time Singapore's defense planners envisaged forward defense out to a thousand miles from the country's shores, effectively putting both the SOMS and South China Sea within the RSN's area of responsibility.¹² Also at the beginning of the 1990s, the RSN expanded its doctrine from sea denial in local waters to limited, defensive sea control, a role that required platforms of greater operational range and endurance.

What this development meant for the RSN was a need for force-projection assets to sustain its coverage of the SOMS and the South China Sea at least, and

with surplus capacity to allow for international security operations in distant, extraregional waters, such as the Gulf of Aden.

However, deterrence through force structure cannot be sufficient for the needs of RSN policy, with its limited capabilities and Singapore's geographical proximity to its neighbors' waters. It is inevitable that some maritime security threats will have to be addressed collectively in order to be effective, rather than going it alone. Diplomacy thus forms a facet of the RSN's naval policy, and is also a reflection of both the manner in which Singapore generally conducts its foreign policy and the broader ambit of the SAF's efforts. Singapore's dependence as a small state on rules-based international mechanisms is understandable, especially against potential predation by more powerful, larger countries. Port visits and naval exchanges aside, RSN diplomacy concerns primarily cooperative measures undertaken with regional and global partners against common maritime security problems. Operations undertaken by the RSN over time reflect these trends, first from the immediate Southeast Asian littoral out to the wider Pacific Rim, and as capabilities allow, progressively beyond East Asian waters.

This twin-pillared RSN policy (deterrence and diplomacy), however, is dependent on two critical factors. First of all, having a strong economy to sustain the RSN is as important as having a strong navy to safeguard Singapore's maritime-derived wealth. Fortunately, Singapore's defense spending is prudent, commensurate with economic growth, allowing the RSN to modernize and acquire the needed force-projection capabilities to exercise sea control over the SOMS and the South China Sea. The second important factor is demography. With Singapore's birthrate declining, the SAF faces a perennial problem in manning, and will continue to in the near- and long-term future.¹³ In order to sustain the RSN policy, especially its deterrence pillar, it becomes imperative for the RSN to take full advantage of technology to enhance the level of automation within its operational elements so as to maximize combat capabilities. Force constraints wrought by manpower shortfalls make the need for cooperative activity all the more urgent, for even with technological multipliers the lack of manpower will prevent expansion of the RSN to a force capable of coping with an increasingly complex array of maritime security issues.

In sum, the RSN's twin-pillared policy can be best viewed through the lens of a navy attempting to evolve into a balanced, high-tech force through maximization of its manpower and material resources on hand, closely connected to cooperation with regional and global partners.

EVOLUTION OF THE RSN FORCE STRUCTURE

It can be observed in the foregoing that the RSN force structure has evolved over time toward balanced capabilities, primarily to allow its execution of missions in

three dimensions—air, surface, and subsurface. A fourth dimension, cyber-space, is also reflected in its recent quest for network-centric capabilities.¹⁴ This evolution has been incremental, shaped by expediency (with respect to manpower limitations) and economic growth.

Up to the end of the 1980s, the RSN force structure was that of a typical coastal-defense navy, restricted primarily to its local maritime environs, in this case the Strait of Singapore. The inventory it possessed then was suited to such roles—small patrol and missile craft, backed by land-based airpower. The sea-denial mission was fulfilled by a squadron of West German-built TNC-45 missile craft, known in RSN service as “missile gunboats” of the *Sea Wolf* class, armed with Israeli Gabriel Mark 1 antiship missiles (ASMs). These small strike craft were adequate as fast, if short-range, interceptors, suitable for rapid “hit-and-run” attacks against a hostile naval force in the Strait of Singapore; their small size allowed them to blend well with the coastal terrain, especially when slugging it out against larger and stronger forces. However, aside from up to eighteen inshore and coastal patrol craft—all gun-armed only, meant for general patrol and surveillance in the strait—they were about all the RSN could muster for sea denial.

The RSN then was far from a balanced force, with serious deficiencies. It had no submarines or antisubmarine warfare (ASW) capabilities to speak of and was weak in antiair warfare (AAW), having no surface-to-air missiles but merely guns, and in mine countermeasures, having only two vintage minesweepers, obsolete against advanced naval mines. Its force-projection capability was scanty, only a handful of World War II-era, American-built tank landing ships (LSTs). Its maritime aerial-surveillance capacity was only fair (Shorts Skyvan short-takeoff-and-landing turboprop aircraft equipped with a short-range radar, backed by four E-2C Hawkeye airborne early warning aircraft mainly designed for air defense and maritime surveillance). In short, the 1980s-era RSN, adequate for policing the narrow Strait of Singapore, was only marginally capable of sea-denial missions and incapable of sea control. It could not project seaward defense out to the Strait of Malacca. Beyond that, to the Pacific Rim, it was capable only of port visits to friendly ports (by the LSTs, which alone could make such voyages).

All this was to change, beginning in the 1990s, when the RSN force structure underwent significant, albeit incremental, enhancements, to bolster its sea-denial capabilities and allow limited force projection into the Strait of Malacca.

The most significant addition of the early 1990s was six missile corvettes based on the West German MGB-62, known by the RSN as the *Victory* class. These craft, with greater endurance than the *Sea Wolf* missile gunboats, provided the RSN a combat platform truly capable of projecting naval presence in the Strait of Malacca and the South China Sea. Second, it also provided the

navy's first basic ASW capability, thus enabling the RSN to tout itself as three-dimensional for the first time. However, this new war-fighting capacity was still far from balanced. Though the corvettes greatly enhanced the RSN's surface striking power with their ninety-kilometer-range RGM-84 Harpoon antiship missiles (which outranged the twenty-kilometer Gabriel Mark 1 and later were retrofitted aboard the *Sea Wolves*), the RSN remained deficient in AAW. Only after 1991 was there apparent haste to retrofit all frontline RSN combat ships with the French Mistral SIMBAD short-range surface-to-air missile; the corvettes themselves were later fitted with the more capable, vertical-launch Israeli Barak-1 antimissile system.¹⁵ The other, somewhat less prominent, addition was a quartet of Swedish-built mine-countermeasures vessels, significant in light of the vulnerability of shipping through the straits to naval mining. No significant improvements were made to the sealift force, though one ex-British landing ship was acquired.

By the mid-1990s, maritime aerial surveillance was improved with Fokker-50 maritime patrol aircraft, which came with full mission suites for surface and subsurface search and targeting; these five aircraft extended not just the RSN's "eyes" but its "sword" as well, with their reported armament of air-launched AGM-84 Harpoon ASMs.¹⁶ At the turn of the 1990s, the eighteen old patrol craft were withdrawn from service and replaced by a dozen much larger, better equipped, locally built *Fearless*-class patrol vessels, six of which were equipped for ASW, like the corvettes. All this was accompanied in the second half of the 1990s by the introduction of submarines—probably the most significant addition to the RSN. Five ex-Swedish *Sjöormen*-class diesel-electric submarines (SSKs) entered the RSN.

With the addition of this undersea component, a nascent, balanced RSN capability was in place by the end of the twentieth century. The Republic of Singapore Navy of 1999 remained primarily a sea-denial force, capable of only limited force projection, but one that was deemed able to cover the Straits of Malacca and Singapore and the South China Sea at least to some extent.

The RSN force structure probably experienced its "golden era" at the beginning of the twenty-first century, with four significant additions. First of all, six *Formidable*-class stealth guided-missile frigates based on the French *La Fayette* entered service. They are important because with them for the first time, a true blue-water combat capability was introduced into the RSN. While they are, like the *Victory* corvettes, capable of three-dimensional warfare, their capabilities far exceed the latter's. A true anti-air capability is arguably one of the key features of the *Formidable* class; their Aster antimissile system, when tied to its long-range Herakles phased-array multifunction radar, extended the fleet's AAW coverage, which was now incorporated (as noted below) into the national air-defense

umbrella.¹⁷ Each frigate has a more capable antisubmarine suite than that of the corvettes and can embark an American-built S-70B Seahawk helicopter, which is designed for standoff ASW and other roles, such as over-the-horizon targeting for Harpoon antiship missiles.

The second significant addition at the turn of the present century was a group of four locally built *Endurance*-class landing platform docks (LPDs)—rated officially as LSTs—whose capabilities far exceed those of the vintage LSTs and thereby, for the first time, greatly enhance the RSN's strategic sealift.¹⁸ The third was the augmentation of the submarine force with two, more-capable ex-Swedish *Västergötland* SSKs, known in the RSN as the *Archer* class. They came equipped with air-independent propulsion (AIP), which allows the boats to stay submerged longer without snorkeling to recharge batteries. Finally, the RSN now incorporated for the first time a full-fledged unmanned combat capability, in the form of Israeli Protector-type unmanned surface vessels, which the RSN first used operationally in the northern Arabian Gulf in 2003. It was reported at the time that the RSN was keen on expanding its unmanned capabilities in all three dimensions, a natural course in view of its quest for increased automation.¹⁹ Beyond these acquisitions, in December 2010 Singapore was reported to be interested in replacing its Fokker-50s with surplus U.S. Navy P-3C Orions, a much more capable aircraft.²⁰ There were also midlife upgrades for the corvettes and mine-countermeasures vessels.

In sum, the Republic of Singapore Navy has now evolved into a truly balanced force, with adequate capabilities in surface strike, AAW, ASW, mine countermeasures, undersea warfare, maritime aerial surveillance, and strategic sealift. The RSN has progressed from a “sea denial-plus” navy to become—in a limited, defensive way—a sea-control force. It is capable of projecting presence not only into the SOMS and the South China Sea for substantial periods but also beyond, into extraregional waters, albeit with limitations. The RSN has also elevated itself into the cyberspace dimension, by becoming an integral part of the SAF's network-centric warfare architecture known as the Integrated Knowledge, Command, and Control (IKC2) umbrella. The stealth frigates, in particular, reportedly serve as key IKC2 nodes in support of the RSN and its sister armed services at sea.²¹

Some observations can be made with regard to the evolution of the RSN force structure, particularly with respect to its impact on regional naval-arms dynamics. First, much was made about the RSN breakthrough in submarine capabilities in the form of AIP and an apparent expansion of its submarine fleet. In fact, however, there are only two *Archer* (ex-*Västergötland*) SSKs, which now supplement but later will replace some of the aging *Challenger* (ex-*Sjöormen*) boats. The inclusion of AIP was only logical for a small navy, extending undersea

endurance, thus maximizing the patrol duration of each boat. Nonetheless, AIP can be rightly deemed as destabilizing in that it allows the *Archer* SSKs to carry out covert intelligence-gathering missions in regional waters—already a source of consternation for some neighboring countries. For instance, remarks made in 2000 by Abdurrahman Wahid, then president of Indonesia, singled out Singapore’s newly acquired submarine capability.²² Still, the RSN may eventually be left with only these two AIP-equipped SSKs, if no new boats are acquired. In view of routine maintenance needs, probably only one *Archer* will be operational at any given time. In effect, the RSN may find itself with a “fleet-in-being” submarine force akin to that of the Indonesian navy.

The second observation pertains to the RSN’s acquisition of a significant sealift capability, in the LPDs. However, the RSN was not the first to introduce a large amphibious assault landing ship; in fact, the Malaysians were the first, with the procurement of *Sri Inderapura*, a former American *Newport*-class LST.²³ In any case, the RSN’s LPDs amply demonstrated their utility for humanitarian and disaster relief operations off Aceh. Thus, acquiring such warships is not necessarily attributable to a quest for offensive amphibious-assault capabilities. Most of the other capabilities that exist in the RSN force structure are no stranger to most other Southeast Asian navies, which could have acquired more of them themselves had not the Asian financial crisis in 1997–98 disrupted their modernization programs.

Finally, important trends are evident in RSN force-structure development. First, it has taken a gradualist path, incrementally addressing capability gaps with respect to multidimensional naval operations. Second, it has adopted a moderated approach to force structure enhancement—apparently deliberately, to judge by remarks made by the former Chief of Navy, Rear Admiral Chew Men Leong, in 2009.²⁴ That is, the RSN has eschewed as destabilizing several naval weapons associated with sustained, high-persistence, long-range force projection—aircraft carriers with organic strike aviation, nuclear-powered submarines, underway logistics support vessels, land-attack cruise missiles (LACMs), and supersonic antiship missiles.²⁵ Their absence may testify to a desire by Singapore’s naval planners not to intensify regional naval arms competition, though there have been opportunities to do otherwise.²⁶ For example, back in 2001 it was reported in the press that the RSN had once considered acquiring a fleet replenishment ship but abandoned the project due to cost.²⁷ Since then, despite economic growth and increased defense appropriations, this project has not been revived. Also, the stealth frigates were designed with modularity in mind, with weight and space reserved for installation of new combat systems if necessary. However, there are as yet no plans to install LACMs. Even the RSN’s submarines, naturally the best platform for such standoff land-attack capabilities, are not known to be armed with such

weapons, not even with ASMs. This is interesting in view of the apparent inclination toward LACMs in the wider Asian littoral, such as in the Australian, Indian, and South Korean navies.

Thus, the RSN's definition of "balanced capabilities" is likely a cautiously calibrated one, dictating a judicious approach to force structure that not only maximizes combat capability commensurate with economic growth but probably also attempts to avoid escalation of regional naval arms competition. In that connection, there seems to have been incorporated into the navy's force structure over time a confidence-building element—in effect, a kind of unilateral naval arms control.

ENDURING TRENDS IN THE RSN'S OPERATIONS

The RSN's diplomacy pillar is reflective of the general foreign policy adopted by Singapore since its inception. Being a small, relatively weak state, Singapore places a premium on rules-based mechanisms for interstate interactions, and accordingly the RSN's activities are designed to promote and sustain an open, inclusive rules-based regional architecture. In recent years, as highlighted above, the RSN has broadened beyond the immediate Southeast Asian and Pacific Rim region into international security operations.²⁸ The diplomacy pillar is designed to complement that of deterrence in two ways. First, as a small navy, the RSN is unable to deal alone with a complex range of maritime security issues; they will have to be dealt with through cooperation with foreign counterparts, especially in the Southeast Asian littorals. Second, Singapore being a small island state with maritime geostrategic vulnerabilities, reliance on international mechanisms serves to safeguard national security interests against predation by larger, more powerful countries. For instance, Singapore has always been a strong proponent of the United Nations Convention on the Law of the Sea as the central guiding mechanism for maritime activity. The RSN's operations are reflective of both these considerations, manifested in the range of maritime confidence-building measures and cooperative measures in which it engages.

Maritime Confidence-Building Measures

Maritime confidence-building measures—information exchanges, communication and observer arrangements—do not constrain naval force structure, combat readiness, or modernization, yet they help mitigate sources of misperception and so reduce the likelihood of inadvertent conflict at sea.²⁹ The RSN currently pursues information exchanges and communication measures. "Information exchanges" formalize and regularize open sharing of naval information, whereas "communication arrangements" involve reciprocal port visits, officer exchanges, and dialogue.³⁰

An important multilateral information exchange measure in which the RSN has actively participated is the Western Pacific Naval Symposium (WPNS). The navy even hosted the second WPNS mine-countermeasures seminar, involving eighteen foreign navies, in 2000. The RSN uses the Codes for Unalerted Encounters at Sea, under the WPNS rubric.³¹ Bilateral maritime confidence-building measures are also particularly crucial within the Southeast Asian littoral. Examples are the information-sharing initiatives between Singapore and Indonesia, for instance, Project SURPIC (that is, Surface Picture), by which the two navies have monitored the SOMS and regularly exchanged information since 2005.³² Traditionally, the RSN's communication measures have been port visits to regional countries, though larger, oceangoing warships have extended them to more distant areas. Perhaps often overlooked in this connection has been the RSN's consistent effort to enhance transparency, such as its official website for public access.³³ Additionally, Singapore has been submitting regular reports to the United Nations Register of Conventional Arms since 1993.³⁴

Maritime Cooperative Measures

Most of the RSN's activities in the area of international collaboration are oriented toward "maritime cooperative measures" as such, which demonstrate the ability of neighboring countries to work together to resolve common maritime security problems, thus deterring potential adversaries, in this case, and assuring extra-regional countries that seaborne trade will not face direct threats. Such measures also have a confidence-building element, through reduction of tension in otherwise politically contentious matters of maritime security concern. Maritime cooperative measures comprise naval exercises, search and rescue, and actions against illegal maritime activities, including marine pollution and piracy.³⁵

The RSN has emphasized bilateral ties with regional navies, and as a result, long-standing maritime cooperative measures exist with its Southeast Asian counterparts. Traditional maritime cooperative measures first emerged, such as bilateral naval training exercises, which over time have expanded in scope. For instance, the Indonesia-Singapore Exercise EAGLE began with at-sea communications, basic maneuvers, and gunnery training but now includes ASW and mine countermeasures. Coordinated patrols constitute another area of maritime cooperative measures in which the RSN engages with its neighbors, such as bilateral coordinated patrols with Indonesia in the Singapore Strait, an arrangement that has led to a significant reduction of sea robberies since its implementation in 1992.³⁶ As for "softer" initiatives, the RSN cooperated with the Indonesian navy in OPERASI SURYA BHASKARA JAYA, a naval, socio-civic activity aimed at community development in underdeveloped Indonesian provinces. Such long-term bilateral naval cooperation facilitated post-tsunami operations

in Aceh. Besides maritime cooperative measures with Southeast Asian counterparts, the RSN pursues long-standing bilateral cooperative measures with the U.S. Navy, like the annual CARAT (Cooperative Afloat and Readiness Training) exercises, conducted since 1995. In all, compared to a mere six foreign exercises in the early 1980s, the RSN had participated in more than forty by 2008.³⁷

The RSN is also increasingly active in wider, regional, multilateral maritime cooperative measures. Long a faithful participant in multilateral naval exercises under the Five Power Defence Arrangements, it has also in the recent decade participated in even larger multilateral training initiatives, such as the WPNS-linked Rim of the Pacific (RIMPAC) and PACIFIC REACH exercises. These maritime cooperative measures go beyond training, especially since the 9/11 terror attacks. Since 2001, for example, the RSN has participated in the U.S.-initiated Southeast Asia Cooperation against Terrorism and the multilateral Malacca Straits Security Initiative.³⁸ As the RSN has acquired platforms more capable of force projection “out of area,” it has begun joining such international security operations as the postwar reconstruction of Iraq and the multinational Coalition Task Force 151 in the Gulf of Aden.

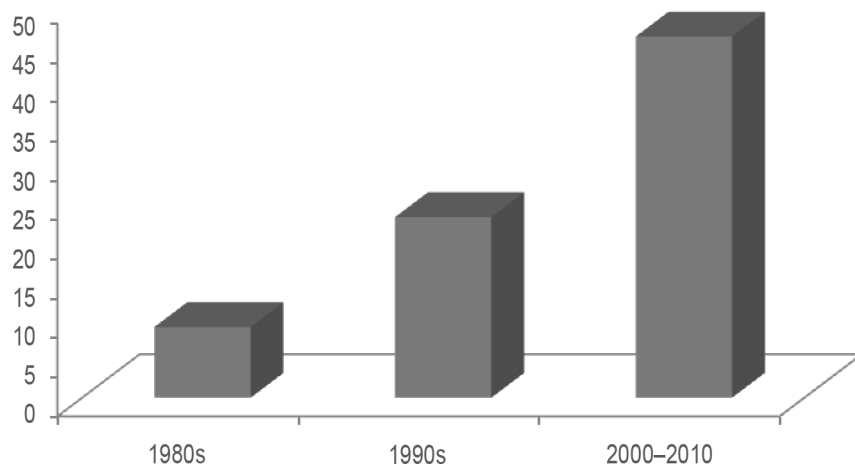
As the figure shows, the RSN’s participation in maritime cooperative measures has increased over the decades as its capabilities have grown, likely for several reasons. First, systemic changes in the global security environment have spurred the RSN to embark on cooperative attempts to address maritime security problems having transnational implications. Second, newly acquired capacities have increased the RSN’s confidence in its ability to expand its international profile. Third, it is not inconceivable that the RSN has intensified its maritime cooperative measure participation as a conscious effort to build confidence in the region, as it embarks on its capability buildup, in line with the twin-pillared policy of deterrence and diplomacy.

Naval Activities in Politically Sensitive Areas

One indicator of whether a navy is being employed offensively is how it acts in politically sensitive areas—maritime zones where sovereignty is contentious. Given its maritime geographical constraints, Singapore is obliged to place much stress on maritime boundary-delimitation arrangements with its larger neighbors. The sovereignty dispute over Pedra Branca serves as an illuminating example of Singapore’s diplomatic behavior and naval activity.

Since the end of colonial rule, Singapore’s maritime forces patrolled waters surrounding that rocky outcrop without Malaysian opposition until 1979, when Kuala Lumpur officially laid claim to it. The Singapore government responded in two notable ways: it emphasized dispute resolution without the use of force, and it continued to conduct routine patrols. Though Malaysian maritime forces

RSN CUMULATIVE MARITIME COOPERATIVE ACTIVITIES



Compiled by the author from various open sources, media and official. Figures as of 2010.

also patrolled near Pedra Branca and despite the absence of bilateral mechanisms for prevention of naval standoffs, there were no shooting incidents. There were at-sea encounters, but none escalated out of proportion. In April 1992, RSN patrol craft warned off a Malaysian Fisheries Department vessel that it alleged had encroached into Pedra Branca waters, but this incident involved no use of armed force and the RSN acted in accordance with international law.³⁹ In December 2002, the RSN and Police Coast Guard (PCG) patrol craft reportedly escorted away a Malaysian Marine Police patrol boat without incident, again in ways consistent with international law.⁴⁰ The restraint displayed by both countries' forces may have facilitated the eventual amicable political-legal settlement by the International Court of Justice in May 2008.

The RSN may in the future delegate regular patrols to the PCG, which has acquired longer-endurance patrol assets, such as the new Dutch-built *Shark*-class coastal patrol craft. Such moves may give these patrols a law-enforcement posture, as opposed to the overtly militaristic, war-fighting impression that regular naval forces employed for this purpose inevitably convey.⁴¹

In the decades since the inception of the Republic of Singapore Navy, continuities and changes in its policies, force structure, and operations have been apparent. The RSN's twin-pillared policies of deterrence and diplomacy can be seen as inseparable and complementary in nature, reflecting the navy's purpose of not merely deterring and defending against maritime security threats but building

confidence as well. A quest for a balanced force capable of a broad range of roles to uphold Singapore's maritime interests in the immediate waters, and later, more ambitiously, in the broader Pacific Rim and beyond, can be observed. Although its force structure displays an inclination toward force-projection capabilities, the nature and pace of its evolution have been judicious, moderated, and incremental. It also corresponds with the scope of RSN operations undertaken in conjunction first with its neighboring counterparts and then with regional and global naval partners. A holistic analysis of its policies, force structure, and operations also shows that the RSN's overall force posture has consistently been one of building confidence among Singapore's neighbors. For the foreseeable future, as it adapts to evolving geostrategic conditions and maritime interests, the Republic of Singapore is most likely to sustain this judicious approach, balancing force structure and its operations to maintain a confidence-building naval posture.

NOTES

1. Singapore's port container traffic is one important indicator of the country's strategic position as a maritime hub. In 1995, this traffic was measured at 10.8 million twenty-foot equivalent units (TEUs), which rose to seven million by 2000, to 24.1 million by 2005, and 30.9 million TEUs by 2008. Data compiled from the United Nations Conference on Trade and Development, *Review of Maritime Transport, 2006, Report by the UNCTAD Secretariat* (Geneva: United Nations, 2006).
2. "MFA Spokesman's Comments on an Exclusive Economic Zone around Pedra Branca," *Ministry of Foreign Affairs, Republic of Singapore*, 25 July 2008, app.mfa.gov.sg/.
3. For instance, Jakarta was particularly concerned and unhappy about Singapore's granting of naval and air force facilities access rights to the American military, the U.S. Navy especially; "Jakarta Ruffled over Singapore-US Navy Deal," Reuters, 6 January 1992. More recently, the Malaysian government accused Singapore's air force of thousands of airspace infringements since 2008; "2,508 Violations of Malaysian Air Space by S'pore Jets since 2008, Dewan Told," *Bernama Daily Malaysian News*, 20 June 2011.
4. The new security environment Singapore has faced, especially since 2001, is characterized by the emergence of nontraditional threats. Robert Karniol, "Teo Chee Hean: Singapore's Minister for Defence," *Jane's Defence Weekly*, 19 November 2003.
5. Rear Adm. Lui Tuck Yew has remarked that the RSN is an instrument of national security policy and can contribute actively in nonwar missions such as peacekeeping and disaster relief. Lee Siew Hua, "Navy Ready to Play Bigger Non-war Role," *Straits Times*, 7 July 2000.
6. "S'pore Committed to Playing Its Part in International Security Operations," *Channel NewsAsia*, 30 September 2010.
7. Republic of Singapore Navy, *Onwards and Upwards—Celebrating 40 Years of the Navy* (Singapore: SNP International, 2007), available at www.mindef.gov.sg/. (The RSN yearbook for 2007—the complete web address appears in the online version of this article.)
8. Ministry of Defence, *Defending Singapore in the 21st Century* (Singapore: January 2000), p. 12.
9. In 1997, the former Chief of Navy stated that the RSN had adopted a double-pronged approach consistent with the defense policy of deterrence and diplomacy—that is, to develop its own defensive capabilities while at the same time seeking "security in numbers"

- through maritime security cooperation. "In Pursuit of Excellence: An Interview with the Chief of Navy, Rear Admiral Richard Lim," *Naval Forces* 18, no. 2, special issue (1997), p. 4.
10. During an interview in 2009, then-Chief of Navy Chew Men Leong remarked that the navy's key mission—to ensure the security of Singapore's SLOCs and seaward defense so as to safeguard the country's sovereignty—remained unchanged. IMDEX Asia Focus, "The Republic of Singapore Navy: Interview with Rear Adm. Chew Men Leong, Chief of the RSN," *Military Technology* 5 (2009), p. 27.
 11. In August 1990, following the Iraqi invasion of Kuwait, then-first deputy prime minister Goh Chok Tong remarked that "there is a lesson in the Iraqi invasion of Kuwait for us," apparently mirror-imaging Singapore's geostrategic vulnerability as a small state relative to its surrounding larger neighbors. Jose Katigbak, "Singapore Says It Must Be Strong to Avoid Fate of Kuwait," Reuters, 28 August 1990.
 12. "The Shrimp with Teeth: Defence Policy Aims at Forward Force Projection," *Economist*, 12 January 1991.
 13. The total fertility rate in Singapore, measured in number of children born per woman, was 1.70 in 1985–90; it declined to 1.58 in 1995–2000 and farther to 1.25 in 2005–10. Data compiled from United Nations, *World Population Prospects: The 2010 Revision* (New York: Dept. of Economic and Social Affairs, Population Division, 2011).
 14. "Three-dimensionality" has been a long-standing goal of the RSN in its capacity-building endeavor. See, for instance, remarks by then-first deputy prime minister Goh in August 1990: "Be Prepared Always for Unexpected Threats" (speech at the commissioning of missile corvettes at Brani Naval Base, 18 August 1990), pp. 3–4, available at *Singapore National Heritage Board*, stars.nhb.gov.sg/.
 15. During the Persian Gulf War, British Sea Lynx helicopters sank numerous Iraqi navy patrol and missile craft with ease, thus demonstrating once again that small combat craft without effective AAW capability are vulnerable to standoff aerial and missile attacks. See "New Missiles to 'Boost Gun Boats' Chances of Survival," *Straits Times*, 19 June 1994.
 16. This was not publicly acknowledged prior to 2000. David Boey, "Spotter Planes Pack a Lethal Punch Too," *Straits Times*, 3 November 2004.
 17. *Formidable* is armed with four eight-cell Sylver vertical-launch systems (VLSs) that fire the Aster missile. The thirty-kilometer Aster-15, which has a fifteen-kilometer antimissile range (not significantly more than the Barak-1's), is the publicized variant carried by the frigates. However, two of the four VLS modules belong to the A50 variant, designed to house the hundred-kilometer Aster-30, which is not confirmed to have been fitted on board the frigates, though the potential remains; *Jane's Fighting Ships*, jfs.janes.com/. The publicized secondary role of the frigates is to augment Singapore's air-defense umbrella, though Rear Adm. Ronnie Tay, then Chief of Navy, dismissed in 2004 the idea that the RSN was seeking an Aegis-type shipboard air-warfare system; see Robert Karniol, "Country Briefing: Singapore—Master Plan," *Jane's Defence Weekly*, 11 February 2004, and David Boey, "3 New 'Stealth' Warships to Help Boost Air Defence," *Straits Times*, 5 February 2008.
 18. See Laura Chua, "Singapore's Endurance Class LST," *Naval Forces* 20, no. 2 (1999), pp. 26–29.
 19. ST Marine designed the Venus unmanned surface vessel, capable of a variety of missions. The RSN is also keen on acquiring unmanned aerial vehicles (UAVs) like the Boeing Scan Eagle, which was tested aboard the LPD, and has reportedly contracted for the design of a low-altitude, long-endurance UAV. "Singapore Interested in Endurance UAV System," *Forecast International Press Releases*, 8 June 2001.
 20. "Singapore Interested in Ex-US Navy P-3s," *Flight Global*, 15 December 2010.
 21. Teh Joo Lin and David Boey, "First of 6 Stealth Frigates Enters Service," *Straits Times*, 5 May 2007.
 22. "Update 1: Wahid Warns Singapore Submarines Not to Stray," Reuters, 26 April 2000.
 23. At 8,450 tons full load, *Sri Inderapura* does not differ much from *Endurance*. It could

carry four hundred troops and three landing craft in its stern well dock, while *Endurance* carries 350 troops and four landing craft. The only clear superiority of the latter is helicopter capacity, having full hangar facilities for two medium-sized helicopters, while the Malaysian vessel has only platform facilities, for just one. *Sri Inderapura* was deactivated following a fire in 2009 that put it out of service completely.

24. Chew remarked that “the SAF will continue to build up capabilities as required to ensure strong and robust defence to make sure we send a deterrence message to would-be aggressors and ensure peace and prosperity for Singapore within the region. We do what is required; we do it with great care. Put simply, I don’t think our capabilities are going to lead to an arms race. We build what’s required for our own defence and our deterrence message is clear.” “The Essence of 3G in the Navy: Total Awareness,” *Straits Times*, 20 February 2009.
25. Weapons that can be deemed destabilizing have some or all of these characteristics—that they decrease warning time, give one country “breakthrough” capabilities, lead to a broadening of target sets, permit no effective countermeasures, give one side better information concerning another’s military preparations, and create hostility. David Mussington and John Sislin, “Defining Destabilizing Arms Acquisitions,” *Jane’s Intelligence Review* 17, no. 2 (February 1995), pp. 88–90.
26. In fact, the force-projection capabilities acquired by the RSN somewhat belonged to the category of defensive sea control, which, according to Mearsheimer, emphasizes attack submarines, land-based patrol aircraft, and escort ships for barrier defense and convoying duties. Offensive sea-control missions, in contrast, are fulfilled by aircraft carriers, nuclear-powered submarines, and LACMs. See John J. Mearsheimer, “A Strategic Miscalculation: The Maritime Strategy and Deterrence in Europe,” in *Naval Strategy and National Security*, ed. Steve E. Miller and Stephen Van Evera (Princeton, N.J.: Princeton Univ. Press, 1988), pp. 56–57.
27. “Singapore Naval Programs Could Face Problems,” *Defense Daily International*, 18 May 2001. Even more notable was that ST Marine in recent years unveiled a roll-on, roll-off/passenger-type, multipurpose support ship targeted for export. Among the roles envisaged for this interesting vessel is underway fleet replenishment, implying that ST Marine possesses the capability to build such a ship for the RSN in the near future if the program is ever revived. “Singapore Launched Fleet Support Vessel,” *Kuala Lumpur Security Review*, 8 June 2009, available at www.klsreview.com/.
28. See “Speech by Mr Teo Chee Hean, Minister for Defence, at Statesmen’s Forum Organised by Centre for Strategic and International Studies” (remarks, “Asia’s Evolving Security Architecture and the Role of the US” conference, Ministry of Defence, Republic of Singapore, 18 January 2008), available at www.mindef.gov.sg/.
29. Duk-Ki Kim, *Naval Strategy in Northeast Asia: Geo-strategic Goals, Policies and Prospects* (London: Frank Cass, 2000), p. 194.
30. *Ibid.*, pp. 195–98.
31. The Codes for Unalerted Encounters at Sea, devised under the ambit of the WPNS for at-sea naval commanders of different participating states operating in close proximity to each other, are essentially methods to make intentions clear to the other party, so as to prevent close encounters at sea from turning into potentially ugly incidents.
32. David Boey, “Singapore, Indonesia Share Sea Security Info,” *Straits Times*, 28 May 2005. In August 2010, SURPIC II, which builds on the success of SURPIC I, was launched; Serena Lim, “Initial Launch of SURPIC II,” *Ministry of Defence Singapore*, www.mindef.gov.sg/.
33. The RSN website is *Ministry of Defence Singapore: Navy—beyond Horizons*, www.mindef.gov.sg/jmindef/mindef_websites/atozlistings/navy/home.html.
34. See United Nations General Assembly, Sixty-Fifth Session, First Committee, *Transparency in Armaments: Reporting to the United Nations Register of Conventional Arms* (New York: Office for Disarmament Affairs), p. 8, available at www.un.org/.
35. Kim, *Naval Strategy in Northeast Asia*, p. 198.
36. In the same year, the two navies established direct communications. Dominic Nathan,

- "Direct Links for S'pore, Indonesian Navies," *Straits Times*, 25 June 1992.
37. These exercises have grown not only in numbers but in scope and complexity. "Interview: Rear-Admiral Chew Men Leong, Chief of Navy, Republic of Singapore Navy," *Jane's Navy International*, 23 May 2009.
 38. The initiative comprises both surface and aerial patrols. Among its primary aims are providing a collective effort among Southeast Asian littoral states and precluding extra-regional intervention in the Strait of Malacca.
 39. According to Singapore's Maritime Port Authority, the Malaysian vessel *KP Landok* first entered Pedra Branca waters on 21 April at 11 AM and moored to a buoy five hundred meters from the islet. The Port Authority pointed out that while foreign fishermen, including Malaysians, are allowed to fish around Pedra Branca, foreign government vessels, unless in innocent passage, must obtain permission to enter Singaporean territorial waters. *KP Landok* was deemed not to be in innocent passage and was instructed by the coastal patrol craft RSS *Swift Cavalier* to leave, at 5 PM. *KP Landok* complied and departed, after circling Pedra Branca once, but returned at 11:20 AM the following day and positioned itself within two kilometers of the islet. At 1 PM, the coastal patrol craft RSS *Swift Knight* asked *KP Landok* to leave; the latter refused to comply until 4:30. The Malaysian account was that up to six RSN patrol craft confronted *KP Landok* and that one of them issued a warning through a loud-hailer, just eight hundred meters from Horsburgh Lighthouse. See "S'pore Protests to KL over Two Intrusions," *Straits Times*, 25 April 1992; and "Johor Councilor Raps S'pore for Chasing Away Malaysian Boat," *Straits Times*, 25 April 1992.
 40. According to the *Malay Mail*, an unknown RSN vessel chased a Malaysian Marine Police boat, *PA41*, on routine patrol, about four nautical miles from Pedra Branca. *PA41* relented and left under RSN and PCG escort. The *Straits Times* account, however, was that the Malaysian craft was actually ferrying journalists to the site. See "Even Our Marine Police Shooed Away," *Malay Mail*, 26 December 2002; and "Singapore Refutes 'Wild' KL Allegations," *Straits Times*, 27 December 2002.
 41. Sujin Thomas, "'Sharks' to Patrol S'pore Waters," *Straits Times*, 17 July 2009. To assign a warship equipped for high-intensity war fighting to fisheries/EEZ patrol not only wastes capabilities but may create a militaristic impression when none is needed and give observers a misleading impression of force disproportionate to what is required. See Harold J. Kearsley, *Maritime Power and the Twenty-First Century* (Aldershot, U.K.: Dartmouth, 1992), p. 46.

THE PORT MORESBY–SOLOMONS OPERATION AND THE ALLIED REACTION, 27 APRIL–11 MAY 1942

Milan Vego

The ultimately unsuccessful Japanese attempt to capture Port Moresby in May 1942 is commonly referred to as the “battle of the Coral Sea.” Almost all focus is usually given to the decisive tactical engagement between carrier forces. However, the Japanese effort was officially code-named Moresby Operation and was often called the “Port Moresby–Solomons operation.” In formal terms, it

Dr. Milan Vego has been a professor in the Joint Military Operations Department at the U.S. Naval War College, Newport, Rhode Island, since August 1991. A native of Bosnia and Herzegovina, he obtained political asylum in the United States in 1976. Dr. Vego has been an adjunct professor at the Defense Intelligence College (1984–91) and a senior fellow at the Center for Naval Analyses in Alexandria, Virginia (1985–87), and at the former Soviet Army Studies Office, Fort Leavenworth, Kansas (1987–89). He earned a BA (1970) in modern history and an MA in U.S./Latin American history (1973) at the University of Belgrade and his PhD in European history from the George Washington University (1981). He holds a license as a master mariner. Dr. Vego has published eight books, including the textbooks Operational Warfare (2001) and Joint Operational Warfare: Theory and Practice (2008; reprint 2009), and The Battle for Leyte, 1944: Allied and Japanese Plans, Preparations, and Execution, plus numerous articles in professional journals. He published his most recent book, Operational Warfare at Sea: Theory and Practice, in December 2008.

was on the Japanese side a major offensive and joint operation, planned and executed to achieve an operational objective—the capture of Port Moresby, on the Australian territory of New Guinea (now Papua New Guinea). For the Allies, in contrast, “the battle of the Coral Sea” was a major defensive and joint operation aimed at preventing an enemy landing at Port Moresby. Both U.S. and Australian naval forces and land-based aircraft took part.

The Japanese inflicted larger losses on the Allies than they suffered and hence won a clear tactical victory; however, the Japanese failed to achieve the ultimate objective of their operation, and hence, the Allies won an operational victory. The operation was the first major setback for the Japanese in their drive, which started with their surprise attack on Pearl Harbor, to expand vastly their control in the Pacific. It is a powerful example of the value and importance of the

human factor in warfare. More generally, and despite the passage of time, the Port Moresby–Solomons operation provides a number of operational lessons of great importance to current and future naval leaders.

THE STRATEGIC SETTING

By the beginning of 1942, the strategic situation in the southwestern and South Pacific had become extremely serious for the Allies. The Japanese were on the verge of victory in the Philippines. They were making rapid progress in their invasion of the Netherlands East Indies (NEI) and thereby threatened northern Australia. The Japanese had included the invasion of the Bismarck Archipelago in their plan, developed in November 1941, as the “First Operational Stage” of the war in the Pacific. In their view, their major base at Truk, in the central Carolines, would not be secure as long as Rabaul, New Britain, was in enemy hands.¹ Accordingly, Japanese troops captured Rabaul on 23 January 1942. The fall of Rabaul alarmed greatly the Australian government and people; Australia’s Northeast Area was now virtually unprotected. The Japanese next occupied the rest of New Britain, as well as the Admiralties, New Ireland, and Bougainville, in the upper Solomons. The vulnerability of Australia was shown on 19 February 1942 when four Japanese fleet carriers conducted a massive raid on the port of Darwin.²

By February 1942, the Japanese had accomplished all their initial strategic objectives, and at far less cost than expected. However, instead of consolidating gains, the Japanese leaders made the fatal mistake of deciding to expand their defense perimeter. Japanese Imperial General Headquarters (IGHQ) in Tokyo had initiated the staff studies for the Second Operational Stage of the war in January 1942.³ The Plans Division of the First (Operational) Section of the Navy’s Section (the Naval General Staff) of IGHQ was a strong advocate of invading Australia. As early as December 1941, the Naval General Staff had insisted on capturing the strategically important points in northern and northeastern Australia; this could be accomplished, it believed, with very little expenditure in men and matériel.⁴ The Naval General Staff argued that Australia represented the greatest threat to Japanese control in the South Pacific, because it could serve as a base for a counteroffensive. Australia also possessed economic resources of great potential importance to Japan’s war industry.⁵ General Hajime Sugiyama, chief of IGHQ’s Army Section (Army General Staff), was opposed to invasion of Australia. He said, “If we take only part of Australia, it could lead to a war of attrition and escalate into total war.”⁶ The Army General Staff instead intended to strengthen the defensive perimeter against the growing enemy force in Australia by capturing Port Moresby and some important positions in the South Pacific. The Japanese had not included Port Moresby as an objective in their plans for

the First Operational Stage of the war. In their view, to secure Rabaul, Port Moresby had to be taken; after the capture of Port Moresby, the enemy's air strength in northeastern Australia had to be neutralized.⁷ The army also considered the Solomons archipelago to be a stepping-stone for an eventual enemy advance toward Japanese-held Rabaul—hence the southernmost island of the Solomons, Guadalcanal, and the islands of Nauru and Ocean (modern Banaba) in the Gilberts had to be captured.⁸

The Combined Fleet started planning for the Second Operational Stage of the war in January 1942. Its commander in chief, Admiral Isoroku Yamamoto, and his chief of staff, Rear Admiral Matome Ugaki, had views different from those of the Naval General Staff. Yamamoto insisted that the Imperial Japanese Navy (IJN) must retain the initiative and cautioned against complacency.⁹ He argued that the IJN must retain the initiative by seizing Midway and capturing the islands of Johnston and Palmyra as advanced bases for an eventual landing on the Hawaiian Islands.¹⁰ Yamamoto considered the capture of New Caledonia, Fiji, and Samoa to be a “folly.” Yamamoto believed that it would be difficult to hold the islands some four thousand miles from the Japanese home islands. Moreover, the operation would not be effective, because as long as the American main fleet was afloat, it could always reach Australia by another route. Yamamoto was willing only to provide ships for the capture of Port Moresby and Tulagi, in the Solomons, but not for other objectives in the South Pacific.¹¹

The original idea of invading Australia was slowly abandoned by the Naval General Staff. Ultimately, both general staffs agreed that the best way of isolating Australia was by capturing Fiji, Samoa, and New Caledonia. Sugiyama urged on Admiral Osami Nagano, chief of the Naval General Staff, the need for both services to study such an operation, dubbed FS. This option received a more favorable view in late February and the beginning of March 1942. On 28 February, a liaison conference concluded that total isolation of Australia was the key to Japan's mastery of the Southwest Pacific.¹²

The Combined Fleet intended also to destroy the British Eastern Fleet and capture Ceylon (today, Sri Lanka) and thereby extend Japanese power over the central Indian Ocean. This in turn would protect the western flank of the East Indies and thereby allow the Combined Fleet to deal with the U.S. Pacific Fleet.

The Combined Fleet presented this plan to the Naval General Staff, which brought it to the attention of the army. The army supported eliminating the British fleet from the Indian Ocean and cooperating with the Germans in the Middle East but protested that the capture of Ceylon would be premature. Army leaders were concerned that if they agreed that troops were available, the navy might divert their scarce resources for Pacific operations. Because of the army's objections and the lack of response from Germany, IGHQ decided to limit

operations in the Indian Ocean to massive raids by the 1st Air Fleet (carrier striking force) against Ceylon and enemy shipping in the Bay of Bengal in early April. This operation would tie up five of the navy's six large carriers until the end of April. Then at least three carriers (*Akagi*, *Sōryū*, and *Hiryū*) would have to return to the homeland for upkeep and refitting; the 1st Air Fleet would not be ready to conduct another major operation until the end of May.¹³

The differences between the navy and the army regarding the objectives in the Second Operational Stage of the war were heatedly discussed during late January and February 1942. On 7 March, the services tried to resolve the dispute at the Imperial Liaison Conference in Tokyo. On 13 March an agreement was finally reached; it was reported to the emperor and distributed in a document entitled "Fundamental Outline of Recommendations for Future War Leadership." In it the option of invading Australia was dropped.¹⁴

On this basis, in mid-March the Combined Fleet formulated a strategic plan for the Second Operational Stage of the war. The plan contemplated the capture of Midway Island by using the full strength of the Combined Fleet, with the aim of luring the U.S. Pacific Fleet into a "decisive battle." From Yamamoto's perspective, a great advantage of this plan was that it would require minimal participation by the army and so would not risk an army veto in IGHQ. The Combined Fleet plan was the subject of the discussion at a conference held at IGHQ on 2–3 April. At the conference the Naval General Staff insisted that the Midway operation include simultaneous capture of the western part of the Aleutian chain, and the Combined Fleet acquiesced. The Naval General Staff also argued that the entire operation should be delayed until late June, because it was unwilling to divert forces from the operation to secure Rabaul in favor of operations in the Central and North Pacific. Yet on 5 April the Naval General Staff, faced with a threat by Yamamoto to resign, reluctantly agreed to his timetable for a Midway-Aleutians operation.¹⁵

In late April, IGHQ's Army and Naval General Staffs agreed to a compromise plan that envisaged the occupation of strategic points in New Caledonia, the Fiji Islands, and Samoa, to be carried out sometime *after* the Port Moresby–Solomons operation.¹⁶ For its part, the Combined Fleet's staff argued that any South Pacific project should be delayed until after the Midway-Aleutians operation.¹⁷ The Naval General Staff replied that preparations for operations in the "South Seas" were already started. It also maintained that Midway was beyond the effective range of Japanese land-based aircraft and that it would be very difficult to garrison and supply even if captured, while its loss would not significantly affect American morale. In the Naval General Staff's view, cutting the supply lines to Australia would greatly affect morale; it would be more likely than a threat to Midway to draw the Pacific Fleet into a decisive battle and thereby shorten the war.¹⁸

The differences between the Combined Fleet and the Naval General Staff over the objectives and timetable of the Second Operational Stage of war were not resolved until after the Allied carrier raid on Tokyo—"the Doolittle Raid"—on 18 April. This raid had (as its planners intended) a great psychological effect on the Japanese strategic leadership. Both the navy and the army had failed in their duty to safeguard the homeland and the emperor from attack. Yamamoto regarded it as a "mortifying personal defeat." The Japanese admirals and generals, suffering great loss of face, now overreacted and made several strategic decisions that proved fatal for Japan.¹⁹ Specifically, they adopted Yamamoto's argument to extend the defense perimeter into the Central Pacific.²⁰ A plan for the Second Operational Stage of war was approved by IJN Directive No. 86: it set (following raids in the Indian Ocean in April) the occupation of Port Moresby for early May 1942, of Midway and the Aleutians for early June, and of Fiji, Samoa, and New Caledonia for July.²¹

On the American side, strategy in the Pacific was largely driven by Admiral Ernest J. King, appointed as Commander in Chief, U.S. Navy (COMINCH) on 20 December 1941. On 16 March, President Roosevelt relieved Admiral Harold R. Stark as Chief of Naval Operations (CNO); ten days later, King assumed the duties of CNO in addition to those of COMINCH. Stark had been very pessimistic about the Allies' ability to stem the tide of Japanese conquests. He had been willing to abandon all positions west of the international date line (longitude 180° east), including the Philippines and Australia. In contrast, King was determined to oppose any further Japanese advance in the Pacific and eventually to mount a counteroffensive. Admiral Chester W. Nimitz, who had replaced Admiral Husband Kimmel as Commander in Chief, Pacific Fleet (CINCPac) on 31 December 1941, was directed by King to halt the Japanese advance, keep the line of communications with Australia open, and mount raids with carrier forces against the enemy's strongpoints in the Pacific.²²

Because of the growing Japanese threat to Australia, the British had suggested that the U.S. Pacific Fleet assume responsibility for defending the northeastern approaches to Australia and for securing Australia's lines of communication with the United States. At first, the U.S. Navy had been reluctant to assume such responsibilities, the Pacific Fleet having been greatly weakened by the Japanese attack on Pearl Harbor. Yet King agreed on 1 January 1942 to study the problem. On 27 January 1942, the ANZAC (Australia–New Zealand Army Corps) Area was established. It encompassed eastern Australia, Tasmania, New Zealand, New Caledonia, New Hebrides (modern Vanuatu), Solomon Islands, Papua New Guinea, and Fiji. Australia and New Zealand would provide forces and would be supported by the United States. The combined force would be under command

of an American flag officer and directly subordinate to the CINC of the United States Fleet (King).²³

King appointed Vice Admiral Herbert F. Leary as the ANZAC Area commander. Leary's task was to cover the northeastern and eastern approaches to Australia and New Zealand, protect friendly shipping in the area, support the defense of island positions, and destroy enemy forces in the area.²⁴

At the end of February 1942, the Australian chiefs of staff assessed the country's defense in light of the fall of Singapore, the raid on Darwin, and the impending Allied collapse in the NEI. They believed that if the Japanese advanced into the Coral Sea to cut off Australia's communications with North America they might attack Port Moresby and then the Australian mainland. In their view, Port Moresby was too vulnerable to be reinforced but too important to be abandoned. Another option for the Japanese was to advance to the Solomon Islands and then capture the New Hebrides and New Caledonia.²⁵

In the spring of 1942 the only troops then available for defense of Australia were about 265,000 militia, poorly trained and equipped. The best Australian troops were deployed abroad—three divisions in the Middle East and elements of one division in Singapore, Timor, Ambon, and Rabaul.²⁶ By mid-April, the Australian army at home had two first-line divisions, an armored division, and eight second-line militia divisions. The 41st Division was then the only major force of the U.S. Army in Australia.²⁷

The key for the successful defense of Australia and New Zealand was the security of their lines of communication to the U.S. West Coast and Hawaii. In the U.S. Joint Chiefs of Staff—the main arena for discussing strategic issues facing the United States—the navy and army had fundamentally different views on strategy in the Pacific. The U.S. Navy realized by February that the Philippines were lost. Hence, it believed, the defense of Australia and of communications to that country was of vital interest to the Allied cause. In contrast, the army's chief of staff, General George C. Marshall, was adamant that the principal effort must be a cross-channel invasion of Europe. The chief proponent of that view was Brigadier General Dwight D. Eisenhower, appointed as the chief of the War Plans Division on 16 February 1942. For the army and Eisenhower the main conditions for winning the war were defense of United Kingdom, continued participation of the Soviet Union in the war, and preservation of Allied positions in the Middle East and India in order to prevent the junction of German and Japanese forces.²⁸ In Eisenhower's view, the Japanese conquest of the NEI removed one of the major reasons for making a stand in the Southwest Pacific. Because the Japanese now controlled the region's oil and tin and practically the world's entire rubber resources, the reasons for committing more forces in the theater were "less compelling than they were three months ago."²⁹

King was persistent in his efforts to establish island bases with army troops and land-based aircraft. He secured a small army force to garrison Bora Bora in the French Society group. By early January 1942, the army had promised to send troops to Canton and Christmas Islands in the Gilberts (Kiribati today), thereby providing additional security to Samoa. It also promised to garrison New Caledonia. On 5 February, King recommended that Funafuti Atoll in the Ellice Islands (Tuvalu today) be made an advance base to cover Fiji and Samoa. He was concerned with the Japanese activity in the Gilberts and was convinced that the Allies had to interpose bases between them and southern Pacific islands.³⁰

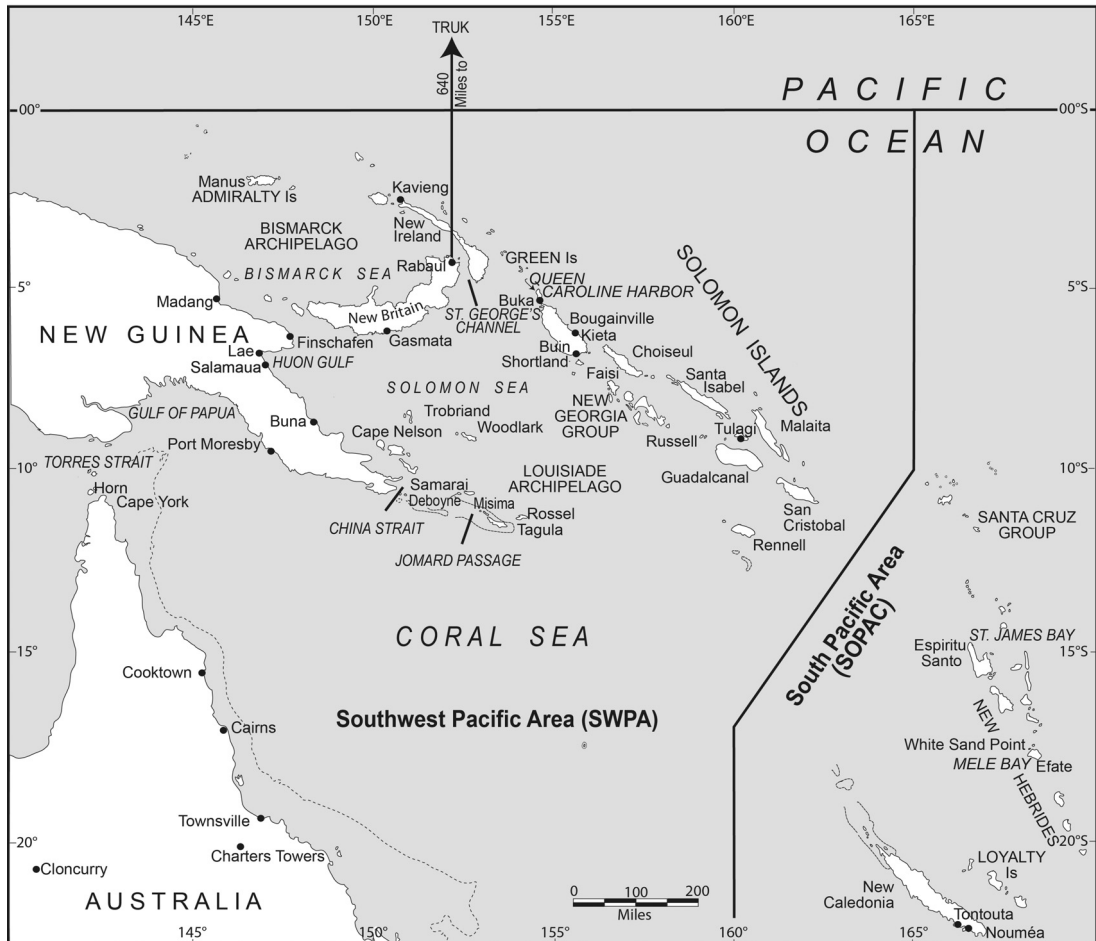
On 5 March, at a meeting of the Joint Chiefs of Staff with President Roosevelt, the main topic was Pacific strategy. Roosevelt seemed to agree with King's views on the strategy to be followed in the Pacific. This in turn led King to direct Rear Admiral Richmond K. Turner, chief of the War Plans Division, to develop a comprehensive plan for the war in the Pacific.³¹ On 16 March, King suffered a major setback: the Joint Chiefs decided to implement a War Department plan for rapid buildup in Europe and restriction of reinforcements in the Pacific to "current commitments." Nevertheless, the Joint Chiefs approved King's request for bases at Efate and Tongatabu. The army believed that three divisions in the southwestern Pacific were sufficient; the Joint Chiefs approved a single Army Air Forces (AAF) pursuit squadron for Christmas Island, Canton, Tongatabu, and Efate. Fiji and New Caledonia would have two squadrons each of medium bombers, about sixty in all.³²

THE THEATER

The size and physical characteristics of a maritime theater play important, even critical, roles in the conduct of war at sea. The Port Moresby–Solomons operation was conducted over a relatively large part of the southwestern Pacific (see map 1). The 1,850,000-square-mile Coral Sea is very deep (average depth about 7,850 feet); it is bounded in the west by northeastern Australia and the Great Barrier Reef, off the coast of Queensland; in the north by southeast New Guinea, the Louisiade Archipelago, the Solomon Islands, and the Santa Cruz Islands; and in the east by the New Hebrides and Loyalty island groups and New Caledonia. Its southern boundary runs along latitude 25° south. The distance from Cooktown to Espiritu Santo Island is about 1,300 miles, while Guadalcanal is about 950 miles away from latitude 25° south. Hence, the Coral Sea provided ample room for carrier operations.

The Coral Sea is generally free of navigational hazards, except for numerous islands and reefs on the western, northern, and eastern fringes, and the 1,600-mile-long Great Barrier Reef to the west. The only routes through the Louisiade Archipelago to the Solomon Sea in the north are the then poorly charted Jomard

MAP 1
OPERATING AREA



Passage, 4.9 nautical miles wide, and the four-mile-wide China Strait off the southeastern tip of New Guinea. The Coral Sea is occasionally subject to fronts moving off Australia, bringing towering cumulus clouds, showers, and squalls over areas fifty to 150 miles wide.³³ However, the weather is dominated by southeasterly trade winds. Hence, during the battle of the Coral Sea the Japanese carriers—moving southward, into the prevailing wind—were able to launch their aircraft much faster than the Allied carriers, which had to turn into the wind, away from the enemy carriers, to launch and recover. On the other hand, the southeasterly wind gave the Allied carriers an advantage during their withdrawal from the operating area.³⁴

The Japanese controlled a large number of positions in the central and southwestern Pacific prior to the Port Moresby–Solomons operation. The most important naval and air base in the central Carolines was Truk Lagoon (Chuuk

today), forty-nine by thirty miles in size. Likewise, the newly acquired base at Rabaul, about 640 miles south from Truk, was centrally located in the southwest Pacific. It has a first-class anchorage. A 620-mile land-based-aviation patrol arc encompassed the Solomons to the east, most of eastern New Guinea to the west, and half of the Solomon Sea to the south.³⁵

Other important positions occupied by the Japanese in early 1942 were Manus Island, in the Admiralties; Gasmata, on New Britain; Kavieng, on New Ireland; Buka Island; Kieta and Buin, on Bougainville; Faisi Island; and Salamaua and Lae on New Guinea.³⁶ The majority of these bases included airfields or seaplane facilities. Rabaul had then two operational airfields (Lakunai and Vunakanau), used by both fighters and bombers; a third was under construction. Both Kavieng and Gasmata had airfields. Kieta had a landing strip, but was not suitable for military aircraft. Faisi Island could serve as a seaplane base. Salamaua had a seaplane base. The airfields at Salamaua and Lae were used by fighters and bombers.³⁷ The anchorage at Shortland Island (seized by the Japanese on 13 March 1942), southeast of Bougainville, could shelter a large number of ships; an inlet at the eastern side of Shortland was suitable for a seaplane base.³⁸

From the Allied perspective, the largest and the most important position was Port Moresby, on New Guinea. Port Moresby is separated from northeastern Australia, 310 miles away, by the Gulf of Papua and the ninety-mile-wide Torres Strait. It was excellently located to support air attacks against the eastern and southeastern coast of New Guinea and the Admiralties. Port Moresby was vulnerable to a landing from the sea. The 13,360-foot Owen Stanley Range provided a degree of security from attack overland.³⁹ Control of Port Moresby would allow the Japanese to blockade the eastern sea approaches to Darwin and deny the Allies a forward base in New Guinea. It would also pose a threat of invasion against eastern Australia.⁴⁰ Port Moresby lacked good port facilities to serve as a base when the Australian troops arrived in early 1941. Port Moresby remained virtually useless for Allied heavy bombers. The nearest supporting airfields were at Townsville, some seven hundred miles away in Australia.⁴¹ In the spring of 1942 Port Moresby was defended by several thousand poorly trained and equipped troops. The rest of New Guinea was defended by a local militia called the New Guinea Volunteer Reserve.⁴²

The principal bases for the Allied ships were Tongatabu, in the Friendly Islands (Tonga); Nouméa, on New Caledonia; Efate, in the New Hebrides; Suva and Nandi, in Fiji; and Tutuila, in the American protectorate of Samoa. However, none were suitable for basing aircraft carriers.⁴³ The nearest place usable for dry-docking aircraft carriers was Pearl Harbor, and for cruisers and destroyers, Sydney, Australia. Nouméa's harbor could accommodate ships of any size. Its entrances were protected by mines, except for the Bulan Passage.⁴⁴ Limited

harbor facilities existed at Port Moresby; St. James Bay, on Espiritu Santo Island, in the New Hebrides; and Nouméa.⁴⁵

Allied air forces used fields at Townsville, Charters Towers, Cloncurry, and Darwin in northern Australia. Horn Island was an intermediate field for aircraft flying to and from Port Moresby. The airfields at Port Moresby were small and were used only for fighter aircraft and as a staging point for bombers en route to the New Hebrides and the Solomons. They also lacked dispersal areas and hence were vulnerable to attack by fighters and bombers. Tulagi was a valuable base for searches by flying boats but was poorly defended and highly vulnerable.⁴⁶ The Royal Australian Air Force (RAAF) operated a few PBY-5 Catalina flying boats from Gavutu Harbor on Tulagi until 2 May, when these aircraft were withdrawn. The Allies also started construction of an airfield at La Tontouta, New Caledonia, as another at Efate, a defended base for fighters and dive-bombers, was nearing completion.⁴⁷ The anchorage at Nouméa was not suitable as a seaplane base, because it lacked anti-aircraft (AA) defenses. Catalinas were also able to use anchorages at White Sand Point and Mele Bay, the New Hebrides.⁴⁸

The Japanese base of operations prior to the Moresby-Solomons operation, anchored at Rabaul, greatly facilitated the offensive employment of naval forces and land-based aircraft toward the Solomons, the Louisiade Archipelago, and southeastern New Guinea. The Japanese naval forces and aircraft based at Rabaul operated along short and diverging lines of operations. For example, the sea distance from Rabaul to Lae is about 450 miles. Tulagi is about 550 miles by the sea southeast of Rabaul. The flying distance from Rabaul to Port Moresby is about five hundred miles.

In the spring of 1942 the Allied base of operations in the South Pacific stretched in the general westerly direction. It flanked the lines of communication from the U.S. West Coast, Hawaii, and the Panama Canal to New Zealand and Australia. Yet it was unfavorable for preventing the Japanese from gaining control of additional strongpoints in the South Pacific. The distances separating the Allied bases from each other and to the enemy bases were long. For example, the sea distance from Nouméa to Tongatabu, Tonga, is about a thousand miles. New Caledonia and the New Hebrides are about the same distance from Australia's coast. The distances from Samoa and Fiji to Rabaul are 2,230 and 3,540 miles, respectively. Nouméa and Rabaul are separated by about 1,385 miles of water. The base of operations for the Allied land-based aircraft in northeastern Australia was far from the newly acquired Japanese bases in the Bismarck Archipelago and the Solomons. For example, the air distances from Townsville and Cairns to Rabaul are 1,100 and 980 miles, respectively. Allied aircraft based in northeastern Australia operated along long and converging lines of operations against targets off the eastern coast of Papua New Guinea.

The Japanese lines of communication within the Bismarck Archipelago and toward southeastern and eastern New Guinea were almost identical to their line of operations. Their hub was Rabaul, and they were short and relatively easy to protect by land-based aircraft and ships. The route between the Bismarcks and the lower Solomons runs through deep water and is partially sheltered. In contrast, the Allied lines of communication to Australia and New Zealand were very long and highly vulnerable to the attacks by enemy submarines. For example, the distances from the Panama Canal to Brisbane and Auckland are 7,765 and 6,540 nautical miles, respectively.

OPERATIONAL COMMAND STRUCTURES

The Japanese in the southern and southwestern Pacific lacked a single theater commander having command and control of all naval and ground forces. The Fourth Fleet (the operational designation of which was the South Seas Fleet) was responsible for all operations in the South Pacific, Caroline Islands, the Marshalls, the Marianas, and Palau.⁴⁹ Its commander was Vice Admiral Shigeyoshi Inoue, with headquarters in Truk; the secondary base was at Kwajalein, the Marshalls.⁵⁰

All Japanese naval land-based aircraft in the southwest and the South Pacific were subordinate to the 11th Air Fleet, under Vice Admiral Nishizō Tsukahara at Tinian, in the Marianas.⁵¹ The 11th Air Fleet consisted of the 21st, 24th, 25th, and 26th Air Flotillas. It was responsible for securing eastern New Guinea, the Bismarck Archipelago, the Marshalls, Wake Island, the eastern Carolines, and the area around the Japanese homeland. It was also to cooperate with the Fourth and the Fifth Fleets.⁵² The 24th and the 25th Air Flotillas were attached to the Fourth Fleet until control returned to the 11th Air Fleet on 17 April. The 24th Air Flotilla was redeployed out of the area, leaving only the 25th Air Flotilla to support the Fourth Fleet. Its headquarters, under Rear Admiral Sadayoshi Yamada, was moved to Rabaul on 29 March and was activated on 1 April. The 25th Air Flotilla was designated the 5th Air Attack Force (5 AAF) for operational purposes.⁵³

The entire Pacific had been designated as an area of U.S. strategic responsibility. On 9 March 1942, the Allies formally divided the Pacific theater into three large “areas” (or in modern terms, theaters of war): the Southwest Pacific Area (SWPA), the Southeast Pacific Area, and the Pacific Ocean Areas (POA).⁵⁴ General Douglas MacArthur was appointed as the Commander, SWPA (COMSWPA); he formally assumed this responsibility on 18 April 1942. The ANZAC Area was formally abolished on 22 April and Admiral Leary was appointed Commander, Allied Naval Forces, SWPA.

On 3 April, the POA was subdivided into three (in modern terms) theaters of operations: the North Pacific Area (above latitude 42° north); the Central Pacific Area (from north latitude 42° to the equator); and the South Pacific Area (south

of the equator and between the eastern boundary of the SWPA and longitude 110° west).⁵⁵

Nimitz took officially the post of Commander in Chief, Pacific Ocean Areas (CINCPOA) in addition to that of CINCPac at 1100 on 8 May 1942, when the battle of the Coral Sea was almost over. Nimitz was directed to appoint a commander for the South Pacific (SOPAC) Area, who, “acting under his authority and general direction, would exercise command of the combined armed forces, which at any time might be assigned that area.”⁵⁶ However, that post was not filled until 19 June 1942, when Vice Admiral Robert L. Ghormley assumed command of SOPAC. He initially established his headquarters at Auckland, New Zealand. Nimitz exercised command over all U.S. naval forces in the Pacific theater, including those in the Coral Sea, by virtue of his authority as CINCPac, but the Coral Sea itself was formally part of MacArthur’s SWPA. Nimitz and Rear Admiral Frank Jack Fletcher, Commander, Task Force 17 (CTF 17), had no control over supporting forces, such as Army Air Forces elements, which were provided by MacArthur. The resolution of this problem was that when American carriers and British or Australian forces operated in the same general area, the carrier task force commander would be in overall command. In all other cases, the senior commander, of either three nations, would be in command.⁵⁷

THE PRELIMINARIES

After the capture of Rabaul and other points in the Bismarck Archipelago, IGHQ directed the Fourth Fleet on 2 February to attack and capture “strategic areas” in British New Guinea and the Solomons as soon as possible.⁵⁸ The first operational objective was to seize the ports of Lae and Salamaua in the Huon Gulf, on the southeastern coast of New Guinea (the SR operation). On 13 February the Japanese navy and army signed an Army-Navy Local Agreement, setting execution of Operation SR for 25 February.⁵⁹ On 16 February, Inoue and Major General Tomitarō Horii, commander of the South Seas Force (or Detachment), agreed that the 2nd Battalion of the 144th Infantry Regiment, reinforced by one mountain artillery battery and other units, would attack Salamaua, while one battalion would capture Lae.⁶⁰

In mid-February, Admiral King temporarily transferred Task Force 11 (TF 11), based on the carrier USS *Lexington* (CV 2), to the ANZAC Area. Admiral Leary, together with CTF 11, Vice Admiral Wilson Brown, was planning to attack Rabaul. B-17 heavy bombers based at Townsville would strike Rabaul at the same time.⁶¹ On 20 February, TF 11 reached a point of about 350 miles south of Rabaul, where Japanese land-based aircraft detected it. In the ensuing encounters in the air the Japanese lost eighteen aircraft and the Americans only two;⁶²

however, the element of surprise had been lost, and hence the carrier attack on Rabaul was abandoned.⁶³

A major effect of this aborted raid was that Inoue decided to delay the SR operation until 8 March.⁶⁴ On 4 March, the 24th Air Flotilla started raids on Port Moresby, Lae, and Bulolo (some thirty-seven miles southwest of Lae). The next day the Japanese convoy sortied from Rabaul bound for the Huon Gulf. Two days later, the convoy split into two groups, one to Lae and the other to Salamaua. On the night of 7–8 March, the Japanese landed and quickly captured both without opposition and immediately started to build bases. By seizing control of the Huon Gulf the Japanese had obtained control of the straits between northeast New Guinea and New Britain, as well as positions from which they could support further advances to the southward.⁶⁵

Nimitz reacted strongly to the Japanese landings in the Huon Gulf by sending TF 17, centered on the carrier *Yorktown* (CV 5), and TF 11 with *Lexington* (CV 2) screened by eight cruisers and fourteen destroyers across the Coral Sea and into the Gulf of Papua. On 10 March, 104 Allied aircraft attacked Japanese shipping in the Huon Gulf from a position about fifty miles southwest of Port Moresby.⁶⁶ The Allied aircraft achieved complete surprise by approaching through the 7,500-foot pass over the Owen Stanley Range.⁶⁷ Japanese sources cited losses as four transports sunk, three ships damaged moderately and three lightly, eleven fighter aircraft lost, and 130 men killed and 245 wounded. Among damaged ships were one seaplane tender, two light cruisers, and one destroyer.⁶⁸ Allied postwar sources claim much larger Japanese losses: thirteen out of eighteen transports sunk or damaged, of which several had to return to Japan for repairs.⁶⁹ About four hundred Japanese were killed in the attack.⁷⁰ The losses in shipping could not be replaced quickly. That was one reason that Inoue decided to postpone the Port Moresby–Solomons operation for one month; another reason was increased Allied air strength over New Guinea.⁷¹

Allied and the Japanese land-based aircraft conducted sporadic attacks on each other's airfields starting in late January. The Allies raided Rabaul with small numbers of aircraft every other night from 24 January to 3 February. Allied attacks on Rabaul intensified in April. B-26 medium bombers struck on 9, 11, 12, 18, and 19 April. On the 11th and 13th attacks on Lae by a small number of medium bombers and fighters caused extensive damage, forcing the Japanese to move aircraft to Rabaul. After further raids on Rabaul on 22 and 23 April, the Allies used only two to three medium bombers, leading the Japanese erroneously to believe that the enemy's air strength at Port Moresby was greatly reduced. In fact, however, the Allies had reinforced Port Moresby, deploying additional P-39 fighters and basing B-25 bombers on Horn Island off the York Peninsula.⁷²

The 25th Air Flotilla intensified its attacks on Port Moresby in early April from Rabaul and Lae. The Japanese raids generally used only about half of a dozen land-based attack aircraft and several fighters;⁷³ for this reason, these attacks were not decisive.⁷⁴ The 25th Air Flotilla began full-scale raids on Port Moresby on 17 April, with fifteen fighters and seven attack aircraft, striking almost daily until the beginning of May.⁷⁵

JAPANESE INFORMATION ON THE ENEMY

The Japanese plans for the Port Moresby–Solomons operation were based on poor knowledge of the whereabouts and movements of enemy naval forces, the carriers in particular. This was a major reason for several decisions that caused major problems and setbacks for the Japanese in the course of the operation. Their main sources of information were visual observation by land-based search aircraft and submarines, interrogations of captured airmen, analysis of combat experience, and intercepts of plaintext messages. The Japanese, unable to decode the Allied radio traffic, lacked direct knowledge of enemy plans and intentions, but their analysis of open sources, such as the Allied broadcasts and printed media, was generally good. For sea reconnaissance, the Japanese relied on land-based medium bombers, flying boats, floatplanes, and aircraft based on ships, though rarely carriers.

The Japanese had fairly accurate information on the strength of enemy garrisons and air elements. For example, on 23 April the Fourth Fleet estimated correctly that Tulagi had a small garrison but that Port Moresby was defended by about five thousand troops. The Japanese assessed (again correctly) that Allied air strength in Australia had been increased, to probably two hundred first-line aircraft. They knew that the Allies had concentrated air strength in the Port Moresby, Port Darwin, and Townsville areas and that air activity in those areas was intense.⁷⁶

However, the Japanese had very poor knowledge of the overall strength of enemy forces in the southern and southwestern Pacific. Their single greatest mistake was to assume, in the absence of information to the contrary, that “there was little probability of the existence of a powerful force in the area after the withdrawal of U.S. carrier force.”⁷⁷ Yet they also believed that it was “not unlikely that the enemy might conduct their own operations against our South Seas Fleet operational area east or south. The only U.S. carrier believed to be in the area is the *Saratoga*.”⁷⁸ These estimates were based on information from a Japanese picketboat that the Americans had employed three carriers in their raid on Tokyo on 18 April. However, from interrogations of captured pilots the Japanese learned that only two carriers (*Enterprise* and *Hornet*) had taken part. This meant, they assessed, that two others, *Yorktown* and *Saratoga*, were available

—they erroneously believed that *Lexington* had been sunk by a Japanese submarine in January 1942. They did not know that *Saratoga* had sustained damage and was under repair. In any case, having observed no enemy carriers in the southern area since 10 March, the Japanese assumed that only one large carrier (*Saratoga*) would be operating there. They believed that the Royal Navy might have in Australian waters a battleship, two or three heavy cruisers, one light cruiser, and several destroyers. They also assumed that “even if the enemy’s submarines are not particularly active, there is a strong chance that at least two or three would operate in the area.”⁷⁹

JAPANESE PLANS AND PREPARATIONS

Inoue, of the Fourth Fleet, and his staff were primarily responsible for planning the employment of naval forces and Base Air Forces (i.e., naval land-based aircraft) in the southwest and south. General Horii, commander of the brigade-sized South Seas Force, and his staff planned for the army troops. In connection with the high-level strategic debates discussed above, an IGHQ directive of 29 January had stipulated that Port Moresby and Tulagi should be seized immediately after Lae and Salamaua. That is, the Port Moresby–Solomons operation would be executed in March 1942, supported by land-based aircraft from Rabaul and seaplanes from newly constructed bases in Lae, Salamaua, and Finschafen.⁸⁰ The original assumption that the enemy would have no carriers in the area became invalid in the light of the raids of February and March 1942 and growing enemy air strength in Australia. As we have seen, in Inoue’s view the capture of Port Moresby and Tulagi would entail much more risk than initially envisaged and would need strong support by the large carrier force. However, Yamamoto needed all five large carriers (*Kaga* had been damaged in a grounding in February 1942) and four battleships for raids against Ceylon and in the Bay of Bengal in early April (Operation C).⁸¹

Inoue sent a message to the Combined Fleet on 20 March pointing out that considering the experience of the Lae–Salamaua operation, especially the appearance of the enemy carrier force, “it would be very difficult to assign protection for the transport convoy by land-based air units, and to protect the airbase establishment and the landing point after disembarkation.” He continued, “I would like to see discussion during a central agreement to doubly ensure the strengthening of land-based air units and the cooperation of a fully equipped aircraft carrier for the coming operation.” The carrier *Shōhō* (14,200 tons full displacement) currently assigned for the operation to the Fourth Fleet was not sufficient in itself.⁸²

Final plans for the Port Moresby–Solomons operation were developed by the Fourth Fleet and subordinate commanders during April 1942. The plans were

considerably affected by Yamamoto's decisions regarding the timeline of the Midway-Aleutians operation and the availability of carriers. The Fourth Fleet also depended on the Combined Fleet for additional cruisers and destroyers and land-based naval aircraft.

On 5 April, Admiral Ugaki, the Combined Fleet chief of staff, circulated an outline of organizational changes based on IJN Directive No. 86. Among other things, the Port Moresby operation, to be code-named "MO Operation," would take place in early May, prior to the Midway-Aleutians operation. From 20 April to 10 May the Combined Fleet would attach to the Fourth Fleet the large carrier *Kaga*, one seaplane tender, Cruiser Division (CruDiv) 5 (*Haguro* and *Myōkō*), CruDiv 6 (*Aoba*, *Kinugasa*, *Kako*, and *Furutaka*), and Destroyer Divisions 7 and 27.⁸³ Inoue also learned that 24th and 25th Air Flotillas would return to the direct control of the 11th Air Fleet commander, Vice Admiral Tsukahara.⁸⁴ In addition, the Combined Fleet attached the light carrier *Shōhō* from the 4th Air Flotilla to the Fourth Fleet; until then it had been used only for ferrying aircraft. Initially scheduled to take effect on 10 May, the command changes were later advanced to 20 April.⁸⁵

Also on 5 April, Yamamoto directed Inoue that all plans for the Fourth Fleet had to be completed by 10 May. It was this change, combined with the advance of the date for the execution of the Midway-Aleutians operation to early June, that had made it impossible to provide the frontline, large-carrier division Inoue had been promised in March. Inoue had been a strong opponent of the Midway operation, because the Fourth Fleet would have to garrison and supply the island after its capture.⁸⁶ He was now even more distressed that only one large carrier would be assigned to the MO operation and asked the Combined Fleet to reconsider. Inoue specifically requested that Carrier Division 2 (CarDiv 2) (*Sōryū* and *Hiryū*) be assigned to the operation, in addition to *Kaga*; CarDiv 2 was considered one of the most effective formations in the entire navy. Another problem with the schedule was that the 25th Air Flotilla would not have sufficient time to neutralize air opposition in the area prior to the start of the operation; its major components would not be ready for combat until 20 April.⁸⁷

Yamamoto, however, was reluctant to assign CarDiv 2 to the Fourth Fleet. That division, together with CarDiv 1, would be part of the pending Midway-Aleutians operation. Also, both carrier divisions needed refitting and training upon their return from the Indian Ocean. Yamamoto therefore decided on 10 April to allocate to the South Seas Fleet CarDiv 5, composed of the new carriers *Shōkaku* and *Zuikaku*, plus two destroyer divisions. However, CarDiv 5 was the least experienced carrier unit in the Combined Fleet. This order became effective on 18 April.⁸⁸

The Fourth Fleet's planners considered three options for seizing Port Moresby: a land approach over the Owen Stanley Range, a "barge mobilization," and a standard landing operation. Capturing Port Moresby by advancing overland was feasible if a road were built over difficult mountainous terrain. Some army commanders preferred this option to the risks of troops embarking on ships, which could be sunk.⁸⁹

"Barge mobilization" meant landing troops in the southeastern part of New Guinea and then transporting them to Port Moresby by self-propelled barges to successive points along the coast. These landings would be conducted during the night to reduce the threat of the enemy's air attack. The Japanese estimated that, at an average advance of sixty-eight miles each night, they would need about five days to reach Port Moresby. The problem was that the sea route to Port Moresby was navigationally very difficult, due to reefs and other obstacles; the barges would have to travel far from the shore. Barge mobilization would have been extremely difficult, but Inoue believed it feasible. Hence, in early April he directed studies for transportation of food and munitions, embarkation rosters, cooking arrangements, etc.⁹⁰ But in the end a standard landing was adopted, despite high risks for the convoy and covering forces; the strengthening of the Fourth Fleet had given its planners increased confidence.⁹¹

The Japanese conducted extensive reconnaissance of the area of Port Moresby and the seas routes from Rabaul westward and southward. The army commander had asked the navy to obtain photographs of the landing area at Port Moresby and the sea area between there and the island of Samarai, in the China Strait. Army officers accompanied reconnaissance flights over the landing area, after 10 April.⁹² Yet after numerous reconnaissance and photographic flights, the Japanese acknowledged that they still lacked accurate information on facilities and enemy strength.⁹³

As the Japanese usually did in preparing for amphibious landings, the 24th Air Flotilla in March conducted reconnaissance flights over the projected route to determine the best sites for seaplane bases; the 25th Air Flotilla did the same in mid-April. The Japanese surveyed waterways east of Australia, confirmed the accuracy of charts, reconnoitered airfields on Horn Island off Cape York in northern Australia, and photographed both landing sites at Port Moresby and potential barge routes.⁹⁴ For some of these purposes the Japanese used short-range, single-float, reconnaissance biplanes that operated from shore bases established by tenders or from the tenders themselves.

On 16 April, Inoue convened a two-day staff meeting to discuss the plan and arrange final orders. Many subordinate commanders voiced strong misgivings. One major problem was the vulnerability of the MO Invasion Force along the

southern coast of Papua New Guinea; enemy air bases were only about three hundred miles away, and swift currents and numerous islands surrounded by reefs severely interfered with the passage of ships.⁹⁵

The MO Invasion Force had three main routes available: the 670-mile-long westward route via the China Strait; a 950-mile route passing eastward around the Louisiades; and an 840-mile route southward through the Louisiades via the Jomard Passage and then across the Coral Sea to Port Moresby. The route through the China Strait was the shortest and ran mostly over deep water; it was also least exposed to the enemy air attacks. However, ships would have to sail in a single column. The eastward route was free of navigational obstacles but was 110 miles longer than the southward route; it was also more exposed to attack by the enemy submarines. The southward route was less navigationally difficult than going westward and more secure than the eastward route; planners adopted it as a compromise.⁹⁶

The plan was to organize the convoy of ships, five from the army and six from the navy. The convoy, after departing from Rabaul, would run through St. George's Channel and then south-southwest, turn southwest, and when eastward of Woodlark Island (Muyua today) head toward Deboyne Island, and then enter the Coral Sea through the Jomard Passage, some 420 nautical miles southward from Rabaul. Afterward, and for the remainder of its advance to the landing objective, the convoy would be open to attack by the enemy aircraft based at Townsville and Cooktown. The planners calculated that if the Jomard Passage was navigated during the evening and a constant speed of eleven knots was maintained, the convoy would be exposed to attack in the Coral Sea for the next twelve hours.⁹⁷ Hence, it was critical to obtain local sea control in the Coral Sea by the MO Carrier Force. The basic idea for doing so was to send the MO Carrier Force sweeping around to the east of the Solomons (to avoid the enemy air searches) to enter the Coral Sea from the southeast, as the MO Main Force passed to the westward (see sidebar, "Japanese Order of Battle, May 1942").⁹⁸

The Japanese planners also grappled with the problem of the barrier reef fronting Port Moresby. The reef is a natural fortress, running along the coast from the eastern tip of New Guinea to Port Moresby, at the distance of from two to ten miles. Passage by landing craft was impeded at both low and high tides. Outside Port Moresby the large Sinavi and Nataera Reefs must be penetrated, by three possible routes: the Liljeblad Passage, the Basilisk Passage, and the Padana Nafua. The Liljeblad Passage was within firing range of the Pafa Coast Defense Battery south of Port Moresby, the current is swift, and sunken reefs lie in the passage and en route to harbor. This route was unsuitable for a large landing

JAPANESE ORDER OF BATTLE, MAY 1942

CINC, COMBINED FLEET: ADM. ISOROKU YAMAMOTO

COMMANDER, FOURTH FLEET (SOUTH SEAS FLEET): VICE ADM. SHIGEYOSHI INOUE

(FLAGSHIP CL *KASHIMA*, RABAU)

MORESBY (MO) MAIN FORCE

(Vice Adm. Aritomo Gotō, Commander, CruDiv 6)

CruDiv 6 (4 CAs—*Aoba*, *Kako*, *Kinugasa*, *Furutaka*)

DesDiv 7 (1 DD—*Sazanami*)

Light Carrier (*Shōhō*)—12 A6M Zero fighters and 9 B5N Type 97 [Kate] torpedo bombers)

TULAGI INVASION FORCE

(Rear Adm. Kiyohide Shima, Commander, CruDiv 19)

CruDiv 19 (1 CM—*Okinoshima*, minus *Tsugaru* and *Tokiwa*)

DesDiv 23 (2 DDs—*Kikuzuki*, *Yūzuki*)

2 Transports (*Azumasen Maru*, *Kōei Maru*)

Minesweeper Flotilla 14 (*Hagoromo Maru*, *Noshiro Maru No. 2*)

2 Special Minesweepers (*Wa No. 1*, *Wa No. 2*)

SC Squadron 56 (*Toshi Maru No. 3*, *Tama Maru No. 8*)

Base Units (400 men of Kure 3rd Special Unit, part of the 7th Construction Bn., two 80 mm AA guns of 3rd Base Unit, one 130 mm MG of 3rd Base Unit, two 80 mm AA guns of 8th Base Unit)

MORESBY (MO) INVASION FORCE

(Rear Adm. Sadamichi Kajiooka, Commander, Torpedo Squadron 6)

Torpedo Squadron 6 (1 CL—*Yūbari*)

DesDiv 29 (2 DDs—*Oite*, *Asanagi*)

DesDiv 30 (3 DDs—*Mutsuki*, *Mochizuki*, *Yayoi*)

DesDiv 23 (1 DD—*Uzuki*, minus *Yūnagi*, *Kikuzuki*, and *Yūzuki*)

1 Repair Ship (*Ojima*)

1 Special Minesweeper (*Wa No. 20*)

TRANSPORT UNIT

(Rear Adm. Kōsō Abe)

1 CM (*Tsugaru*)

11 transports: 5 navy (*Mogamigawa Maru*, *Akihasan Maru*, *Chōwa Maru*, *Goyō Maru*, *Shōkai Maru*), 6 army (*China Maru*, *Daifuku Maru*, *Asakayama Maru*, *Matsue Maru*, *Mito Maru*, *Nichibi Maru*)

South Seas Force (5,000 men)

Base Units (embarked; some 500 men of 3rd Kure Special Naval Landing Force, 10th Construction Section, four 120 mm AA guns and two 80 mm AA guns of 8th Base Unit, two 80 mm of 4th Base Unit, part of the Base Unit—Communication Personnel, Transportation Section)

MORESBY (MO) SUPPORT FORCE (COVERING FORCE)

(Rear Adm. Kuninori Marumo, Commander, CruDiv 18)

CruDiv 18 (2 CLs—*Tenryū*, *Tatsuta*)

2 AVs (*Kiyokawa Maru*, *Kamikawa Maru*)

Gunboat Division 5 (2 XAVPs—*Nikkai Maru*, *Keijō Maru*)

1 Transport (*Shōei Maru*)

Minesweeper Flotilla 14 (*Hagoromo Maru*, *Noshiro Maru No. 2*)

Base Units (part of Kure 3rd Special Unit, part of the Communication Personnel of 8th Unit)

MORESBY (MO) CARRIER FORCE

(Vice Adm. Takeo Takagi, Commander, CruDiv 5)

CruDiv 5 (2 CAs—*Myōkō*, *Haguro*, minus *Nachi*)

CarDiv 5 (5th Air Flotilla), Rear Adm. Chūichi Hara, Commander (2 CVs
—*Zuikaku*, *Shōkaku*)

(*Shōkaku*—21 A6M Zero fighters, 20 D3A Type 99 [Val] dive-
bombers, 19 B5N Type 97 [Kate] torpedo bombers)

(*Zuikaku*—21 A6M Zero fighters, 21 D3A Type 99 [Val] dive-
bombers, 20 B5N Type 97 [Kate] torpedo bombers)

DesDiv 27 (4 DDs—*Shigure*, *Yūgure*, *Ariake*, *Shiratsuyu*)

DesDiv 7 (1 DD—*Shioakebono*, minus *Sazanami*)

1 Fleet Tanker (*Tōhō Maru*)

VICE ADM. TERUHISA KOMATSU, COMMANDER, SIXTH FLEET

SUBMARINES

(Capt. Mitsunage Iwagama)

Eastern Detachment, SubRon 8 (Patrol/Scouting Group) (*I-21*, *I-22*, *I-24*, *I-28*,
I-29)

SubGru 21 (Raiding Force) (*RO-33*, *RO-34*)

SUPPLY FORCE

2 Fleet Tankers (*Ishirō*, *Hōyō Maru*)

BISMARCK AREA (R) DEFENSE FORCE

(Rear Adm. Masao Kanazawa, Commander, 8th Base Unit)

8th Signals Unit

8th Submarine Base Force

81st Garrison Rabaul Unit

Gunboat Div 5 (*Seikai Maru*)

SC Div 56 (*Kotobuki Maru No. 5*)

MO INVASION ARMY UNITS

(Maj. Gen. Tomitarō Horii)

144th Infantry Regt.

1st Co., 55th Cavalry Regt.

1st Bn., 55th Mountain Engineer Regt.

2nd Co., 47th Mobile AA Bn.

6 Army Transports (part of the MO Invasion Force)

25TH AIR FLOTILLA (5TH AIR ATTACK FORCE)

(Rear Adm. Sadoyashi Yamada, Commander, 25th Air Flotilla)

1st Force (Tainan Air Group, at Rabaul, Lae) (18 Zero and 6 Type 96 fighters)

2nd Force (4th Air Group, at Rabaul, Lae) (17 Type 1 land-attack bombers)

3rd Force (Motoyama Air Group, at Rabaul) (26 Type 96 land-attack aircraft)

4th Force (Yokohama Air Group, at Tulagi, Shortland Island, Deboyne Island)
(12 Mavis reconnaissance aircraft, 9 Zero Model 21 fighters)

Special Duty Force (1 AV—*Mogamikawa Maru*)

NAURU AND OCEAN ISLAND INVASION FORCE

(Rear Adm. Kiyohide Shima, Commander, CruDiv 19)

CruDiv 19 (*Okinoshima*, *Tsugaru*, minus *Tokiwa*)

DesDiv 23 (2 DDs—*Kikuzuki*, *Yūzuki*)

2 Transports (*Kinryū Maru*, *Takahata Maru*)

6th Base Naval Landing Party

Kashima Naval Landing Party

1 CL (*Tatsuta*); 1 CM (*Tsugaru*) (after 11 May)

Sources: Bates et al., *Battle of the Coral Sea*, app. 1, p. 8; *Japanese Army Operations in the South Pacific Area*, pp. 53, 56–57.

force. The Basilisk Passage was a standard waterway but was in the direct line of fire from coastal batteries. The Padana Nafua route avoided these problems and was considered by the planners the most favorable.⁹⁹

There was also the problem of sustaining troops once they landed. The Port Moresby area, poor in water resources, relied on rainwater; it was estimated that only four or five thousand troops could be stationed there.¹⁰⁰ Supplies would have to reach a Japanese garrison by a long and vulnerable sea route either from Rabaul or the Huon Gulf or over the Owen Stanley Range. The ever-increasing enemy air strength in northern and eastern Australia would make it difficult for the Japanese to hold Port Moresby even if the landing was successful.

On 23 April, Inoue issued Order No. 13 as the basic directive for MO.¹⁰¹ It directed the South Seas Fleet and the South Seas Force to seize Port Moresby, important positions in southeastern New Guinea, and Tulagi Island in the lower Solomons; to establish air bases; and to intensify air operation around Australia. The services reconciled differences in a new Army-Navy Local Agreement on 25 April, and details were worked out by 3 May.¹⁰² On 28 April IGHQ issued directives for the execution of the operation. For the Japanese high command, the overall strategic objective remained isolation of Australia from the United States and other Allies. The capture of Port Moresby and Tulagi would be followed by the occupation of important points in New Caledonia, Fiji, and Samoa. From these new bases, the Japanese aircraft and submarines would interrupt, if not cut off entirely, the flow of the enemy's troops and matériel to Australia and prevent it from becoming a base for a counteroffensive.¹⁰³

On 28 April, Vice Admiral Takeo Takagi, commander of the MO Carrier Force, issued orders to his forces. As directed by Inoue, his order included strikes against the enemy's bases in northeastern Australia. Rear Admiral Hara, commander of CarDiv 5, was very dissatisfied with the role assigned to his carriers. He was especially critical of the task of conducting strikes against the enemy's bases in northeastern Australia. In his view, it was too risky to operate carriers within the effective range of the enemy land bases. Another problem was the presence of reefs and other navigational hazards in the area, which would limit the maneuvering area for his carriers. Logistical sustainment under way was also inadequate, because only a single fleet oiler was assigned to CarDiv 5 and its destroyers. On 29 April, Inoue modified his order and left to Takagi's discretion whether to attack enemy air bases or not. Takagi was allowed to cancel the planned strikes if he failed to achieve surprise. However, the same day, Yamamoto directed Inoue to cancel all strikes on northeastern Australia. The MO Carrier Force was to focus exclusively on the enemy carriers, while attacks on Australia's mainland were to be conducted by naval land-based aircraft. On 30 April, Inoue formally canceled strikes on the Allied airfields in northeastern Australia. At the same time he directed Takagi that

CarDiv 5 was to embark eighteen A6M Zero fighters for the 25th Air Flotilla and ferry them to Rabaul.¹⁰⁴

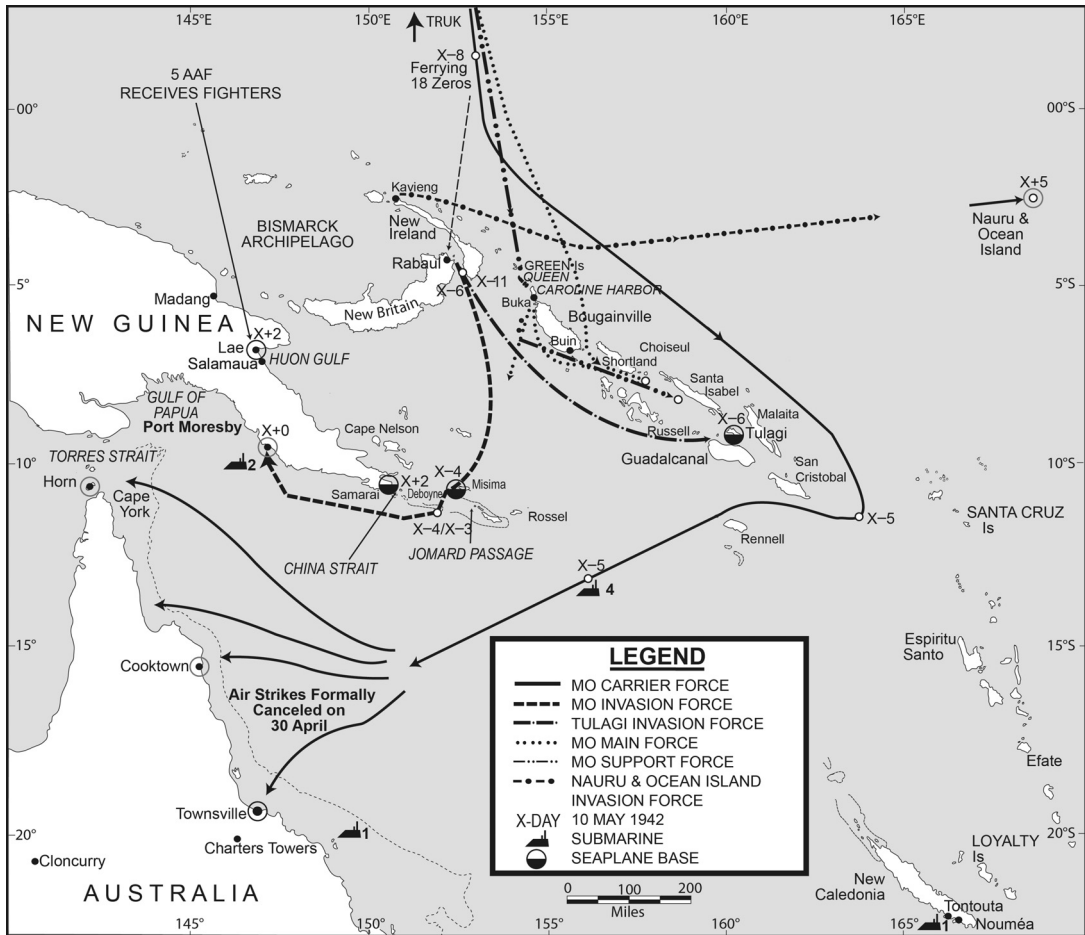
Inoue's plan was extremely complex (see map 2). The Fourth Fleet planners assumed that the enemy commander would be aware of the movements of the Port Moresby Invasion Force and would deploy a force into the Coral Sea to intercept it. The Japanese took as granted, however, that they would achieve surprise. Objectives and events were sequenced with little consideration for potential difficulties arising from long distances, poor radio communications, bad weather, or unforeseen events. The most fateful mistake by the Japanese, one that would be repeated on many occasions in the Pacific War, was the assumption that the enemy would passively accept the Japanese narrative and react in a preordained way.¹⁰⁵

The capture of Port Moresby was the principal and ultimate objective of the entire operation. It was an *operational* objective, in terms of its scale. The Japanese believed that by controlling Port Moresby they would deny the enemy a major air base within effective range of Rabaul. From Port Moresby the Japanese could dominate the whole of New Guinea and threaten northern Australia.¹⁰⁶ It would help secure Lae and Salamaua from the enemy's air attack. For its part, the Combined Fleet believed that MO operation could force the U.S. Pacific Fleet to respond, thereby setting a trap for its destruction.¹⁰⁷ However, there was a serious mismatch between ends and means. Even if successful, the Japanese clearly lacked sufficient air strength to counter the growing Allied air capabilities in northeastern Australia. Enemy aircraft would be still able to attack Japanese forces in the western Coral Sea.¹⁰⁸

The capture of Tulagi was a supporting and major *tactical* objective. A seaplane base there would protect the left flank of Japanese forces moving to seize Port Moresby. It would allow the Japanese to extend their search coverage farther eastward. Also, the Japanese believed, a seaplane base at Tulagi would make it difficult for the enemy to conduct reconnaissance from Nouméa and Port Moresby to track Japanese movements.¹⁰⁹ The Japanese, in contrast, would be able to search east of the Solomons and over the eastern Coral Sea. The plan also envisaged the capture of Samarai Island, as the key to controlling the China Strait.¹¹⁰

The Japanese made a major error in trying to capture Tulagi and Deboyne Island (where a seaplane base would be established) in the course of the operation. It might have been better to do so beforehand, making the MO operation itself simpler and more executable. However, the single greatest error in the designing of the Port Moresby–Solomons operation was failure to initially obtain local control in the Coral Sea. The main prerequisite of success was the destruction or serious weakening of the enemy's operational center of gravity, his carrier force; only after that was accomplished would the other objectives have been achievable.

MAP 2 JAPANESE OPERATIONAL IDEA (SCHEME)



Instead, the Japanese believed that all force elements could be deployed and sent to the objective area almost simultaneously.

In addition, the plan for logistical sustainment of naval forces was inadequate.¹¹¹ The supply group consisted of only two fleet oilers (some sources say three). In addition, only one fleet oiler was assigned to the MO Carrier Force. This greatly increased the time required for the carriers to refuel at sea and thereby made them more vulnerable to enemy submarine and air attack.

Unity of command in Japanese army-navy operations was rare: separate command of army and naval units was the general practice; the Port Moresby–Solomons operation was an exception. Inoue exercised formally full command and control over all navy and army forces. Under him, Vice Admiral Aritomo Gotō commanded all the invasion forces, and Major General Horii the army

occupation units. However, the majority of naval units did not belong organically to the Fourth Fleet. The navy's land-based aircraft were subordinate to Admiral Tsukahara, commander of the 11th Air Fleet, and the submarines were under control of Vice Admiral Teruhisa Komatsu, commander of the Sixth Fleet. CarDiv 5 and CruDiv 5 were temporarily under Inoue's command; by the end of May 1942 they were scheduled to return to their organic forces.¹¹² Vice Admiral Takeo Takagi was the commander of the MO Carrier Force. However, because he had little experience in air operations, Rear Admiral Chūichi Hara was in tactical command of CarDiv 5.¹¹³

Inoue and his planners divided available seagoing forces into nine elements for the Port Moresby–Solomons operation and one for the separate Nauru–Ocean Island operation. A short timeline meant that several units had to be assigned multiple tasks (sidebar 1).¹¹⁴ The rationale was speed of execution, but it meant that the entire force was fragmented and its overall strength was greatly weakened. Finally, though the outcome of the entire operation hinged on achieving surprise, there was no deception plan.

The MO operation was to be completed within twelve days, from the first force deployment to the landing at Port Moresby. No flexibility was incorporated to provide for delays due to unforeseen events or enemy actions. Specifically, the landing at Port Moresby would take place on 10 May (X-day). Tulagi would have been captured on X–7 (3 May). Seaplane bases would be established at Tulagi on X–6 (4 May), on Deboyne Island on X–4 (6 May), and on Samarai on X+2 (12 May). Naval construction troops would repair the airfields and receive the fighters of 5 AAF at Lae on X+2 (12 May). The Nauru–Ocean Island Invasion Force, sailing out of Kavieng, would seize these two islands on X+5 (15 May).¹¹⁵

The initial task of the MO Main Force was to provide distant cover for the Tulagi landing.¹¹⁶ Inoue wanted the light carrier *Shōhō* to be part of the MO Carrier Force. However, at the insistence of General Horii, who was worried about inadequate AA defense of the MO Invasion Force, *Shōhō* was assigned to the MO Main Force.¹¹⁷ The Japanese apparently believed the Allies could react strongly to the capture of Tulagi and that the MO Main Force could be positioned some 150 miles west of Tulagi, so as to cover either Tulagi or the MO Invasion Force. In any case, Gotō's force was not strong enough to defend either force against the determined attack by enemy carriers.¹¹⁸ The MO Support Force (also called the Moresby Escort Fleet) was to support both Tulagi and Port Moresby landings.¹¹⁹ In addition, it would construct seaplane bases on Deboyne and Samarai Islands.¹²⁰

The *Zuikaku* and *Shōkaku* carrier groups were organized as a single force, thereby greatly increasing their offensive capabilities.¹²¹ The principal task of the

MO Carrier Force was to provide distant cover and protection to the MO Invasion Force and destroy the enemy fleet if it appeared.¹²² However, it was also to pass within 350 miles of Rabaul to ferry eighteen Zero fighters there on X-8 (2 May).¹²³ Afterward, it would sail east of the Solomons, provide direct support to the Tulagi Invasion Force, and then on X-5 (5 May) (one day after the flying boats started to use the Tulagi base) enter the Coral Sea eastward of the Solomons to support the MO Invasion Force as required. If a strong enemy force was detected, the MO Carrier Force was to attack and destroy it; otherwise, it would prepare for a decisive encounter while protecting the MO Invasion Force. After the landing at Port Moresby, the MO Carrier Force would remain five more days in the area to counter the appearance of a powerful enemy naval force in the Coral Sea.¹²⁴

Most submarines that took part in the Port Moresby–Solomons operation belonged to the “Eastern Detachment” of Submarine Squadron 8 (SubRon 8). These submarines were planned to leave for Truk in mid-April.¹²⁵ The task of SubRon 8 was “to prepare for the enemy fleet, deploy, and wait for the enemy.”¹²⁶ On X-5 (5 May), four submarines from SubRon 8 would establish a scouting line about 285 miles southwest of Guadalcanal to intercept an enemy force passing from Brisbane and Sydney toward Tulagi. Also, one submarine would patrol off the eastern Australian coast and another near Nouméa.¹²⁷ Two submarines of SubGru 21 (or Raiding Force) would reconnoiter the approaches to Port Moresby, attack enemy ships, and guide the invasion convoy to the outer harbor.¹²⁸

Though execution of the operation was to be almost simultaneous, the actual departures of forces taking part were staggered; basing areas were widely separated, distances to the objective areas were long, and speeds of advance varied greatly. The Tulagi Invasion Force and the MO Support Force would sail on 29 April from Rabaul and Truk, respectively. The MO Main Force would leave Truk on 30 April, and the MO Carrier Force would sortie from Truk the next day. The MO Invasion Force would sail from Rabaul on 4 May.¹²⁹

INFORMATION AVAILABLE TO THE ALLIES

The U.S. Navy’s communications intelligence (COMINT) was the principal source of intelligence on the IJN at the beginning of the war in the Pacific. In the spring of 1942, three centers analyzed Japanese radio traffic, all regularly exchanging data to assist each other in traffic analysis, call-sign recovery, and the deciphering of messages. In Washington, D.C., was Section G, the “Communication Security Section” (code name NEGAT), within the Office of Naval Communications. The other two stations—HYPO (or Fleet Radio Unit Pacific [FRUPAC]), at Pearl Harbor, and BELCONNEN (or Fleet Radio Unit Melbourne [FRUMEL])—served the Allied commands in the Pacific. On the CNO staff,

Op-20G, the Navy Radio Intelligence Section, was responsible for integrating all COMINT on the IJN.¹³⁰

All three COMINT stations in the Pacific focused on intercepting and decoding radio messages sent in the IJN's *Naval Codebook D*, or JN-25, cryptographic system. About half the high-level communications in the IJN used JN-25. In April 1942, the IJN planned to issue a new *Naval Codebook D*. However, delays in distribution postponed the changeover first to 1 May, and eventually to 27 May.¹³¹ Had it gone over to the new edition as originally scheduled, U.S. cryptanalysts would have been in the dark for many weeks at a critical time.

COMINT was the single most valuable source of accurate and timely information on the enemy's intentions for Admirals King and Nimitz and the major naval commanders in the Pacific. This information was especially critical early in the war, when the Allies were numerically inferior to the Japanese. Timely information on where the Japanese carrier forces were allowed Nimitz and King to employ carrier forces for raiding newly acquired Japanese positions.¹³² It would soon allow timely deployment of carrier groups to thwart major Japanese thrusts, notably in the Coral Sea and at Midway. MacArthur relied less on COMINT than did Nimitz and King and far more on visual reconnaissance, both aerial and from coastwatchers.¹³³

The Allied cryptanalysts read and decoded a large number of IJN messages in the spring 1942 that were directly or indirectly related to Japanese plans for the Second Operational Stage of the war. On 29 January, the Allies decoded the first messages indicating that the Japanese were conducting searches south of Rabaul;¹³⁴ in February, the COMINT centers in Hawaii, in Melbourne, and on Corregidor issued warnings to King, Nimitz, and Admiral Thomas C. Hart, commander of the Asiatic Fleet. Admiral Leary, commander of the ANZAC Area, received warnings of the Japanese future operations in the direction of Lae, Port Moresby, and the Solomons. Collectively, these warnings convinced Nimitz in late February that a Japanese offensive was planned for the Port Moresby area. Within a week, U.S. task forces were alerted.¹³⁵

The first specific indication of the pending operation against Port Moresby was a decoded Japanese message of 25 March: "All attack forces continue operations in accordance with [an unidentified message reference]. . . . On 26th #2 (Air) Attack Force continues to support main task and using fighters assist #5 (Air) Attack Force in RZP campaign and with scouts carry out patrol in your assigned area. #5 (Air) Attack Force continue attacks on RZP and . . . and carry out patrol in your assigned area."¹³⁶ Cryptanalysts tentatively located "RZP" in the Port Moresby area. Initially, they believed that both RZP and RZQ referred to the Port Moresby area; later they concluded that RZQ was a seaplane base in Port Moresby and RZP was the town itself.¹³⁷

Reportedly, Allied analysts were able to read all the Japanese messages in April and May 1942. They were able gradually to discern Japanese intentions from the movements of various naval and air units and arrivals at Truk and Rabaul. They received such a vast number of messages that even without decoding them all, they gave Nimitz warning in time to move carrier forces into the Coral Sea.¹³⁸

The Allied cryptanalysts learned on 5 April about the Combined Fleet's assignment of *Kaga* to the Fourth Fleet; *Kaga* was an addressee in communications between Fourth Fleet and the Combined Fleet regarding the Port Moresby operation. Within a few days cryptanalysts linked *Kaga* and the "RZP campaign," understood to refer to Port Moresby. On 10 April, the Allied COMINT deduced that *Kaga* and a new *Shōkaku*-class light carrier, identified erroneously as *Ryukaku* (actually the small carrier *Shōhō*) could be used for offensive operations.¹³⁹ It was estimated that all the available enemy large carriers were then in the Indian Ocean and that it would be several weeks before any large carriers would be available to the South Seas Fleet.¹⁴⁰

On 17 April, the Australian Combined Operational Intelligence Centre (established on 5 March 1941) in Melbourne outlined "indications of an imminent move by Japan against Australian territory." It concluded that the enemy intended to carry out an offensive from the Truk–New Britain area, probably during the first week of May, with the major objective of seizing control of the New Guinea–Torres Strait area, involving the occupation of Port Moresby. The report estimated that the Japanese naval forces for the pending offensive would consist of two or three aircraft carriers (*Zuikaku*, *Shōkaku*, and "*Ryukaku*"), five heavy cruisers, four light cruisers, twelve destroyers, and a submarine force.¹⁴¹

MacArthur's intelligence section was very skeptical about Japanese intentions against Port Moresby. On 21 April, Colonel Charles A. Willoughby, MacArthur's assistant chief for intelligence, prepared for his chief of staff, Lieutenant General R. K. Sutherland, a status report based on (but not attributed to) COMINT from Melbourne. Willoughby questioned the navy's view of the reported Japanese naval and ground-based air strength in the Fourth Fleet area. He believed the buildup posed more of a threat to the coast of Australia and New Caledonia than to Port Moresby.¹⁴²

The Allies learned on 25 April that reinforcements continued to arrive at New Britain. The units of Gunboat Division 8 were en route from Sasebo to Rabaul.¹⁴³ On 26 April American analysts deduced that three carriers—"Ryukaku," *Zuikaku*, and *Shōkaku*—were en route to Truk and would arrive there about 26 April.¹⁴⁴ On 27 April, the commander of the Fourteenth Naval District (COM 14, with headquarters at Pearl Harbor) believed that air reinforcements for New Britain would arrive from the Marianas and Marshalls in the immediate future. There were more indications that CarDiv 5 and CruDiv 5

(less *Nachi*) and destroyers would operate southward of Truk.¹⁴⁵ On 28 April, COM 14 learned that the Fourth Fleet had directed four units to join another group to search for and engage the enemy eastward of New Britain. The analysts believed that this other force consisted of units from CruDivs 6 and 18, strengthened by at least one carrier, "*Ryukaku*," and perhaps two heavy cruisers of CruDiv 5.¹⁴⁶

The main sources for tactical (as opposed to strategic and operational) intelligence were the reports of land-based reconnaissance aircraft based in northeastern Australia and at Port Moresby, flying boats at Nouméa, submarines, and the coastwatcher service. SWPA aircraft flew flank-reconnaissance patrols around Thursday Island, Port Moresby, and Rabaul. They also extensively reconnoitered the Solomon Islands and the area southeastward to the boundary of the Southwest Pacific Area, and the Solomon Sea west of Tulagi. In addition, SWPA's aircraft patrolled from Buna, southeastward along the north coast of New Guinea and the Louisiades, and then westward, south of the Louisiades, to Port Moresby. The area around Townsville was patrolled out to five hundred miles. Allied search aircraft conducted routine patrols across the mouth of the Gulf of Carpentaria and off the Darwin area. SWPA bombers and fighters at Port Moresby also often conducted photographic and armed reconnaissance around Salamaua, Lae, Madang, Gasmata, and Buna. After 1 May, however, no searches of the area east of the Solomon Islands were conducted, either by the RAAF from Tulagi or by the AAF in Australia or at Port Moresby.¹⁴⁷

The coastwatcher service was organized by the Royal Australian Navy (RAN) in 1939. It used officials of local administration and civilian residents to report on shipping movements and other unusual activities along some 2,485 miles of coast in Australian New Guinea, the Admiralties, the Bismarck Archipelago, the Solomons, and the New Hebrides.¹⁴⁸

The Allies had relatively good knowledge of the Japanese air facilities and air strength in the newly occupied areas of eastern New Guinea, the Bismarck Archipelago, and the Solomons. They estimated (inaccurately) that on 25 April the Japanese had sixty-eight aircraft (fourteen fighters, forty bombers, and fourteen patrol aircraft) deployed in Rabaul and about twenty-four aircraft (all fighters) at Lae.¹⁴⁹

Subordinate to Nimitz was the seaplane tender *Tangier* at Nouméa; it had six Catalinas available for search. From 1 through 4 May, they flew daily patrols in a northwesterly sector out to seven hundred miles. Because of their small number, the Catalinas could search only once a day. This was not sufficient to ensure detection of enemy forces entering the Coral Sea from the eastward around San Cristobal Island or through any of the passages northwestward of that island. Had the Catalinas redeployed to or staged through Efate, their effective search

could have been extended up to 180 miles on the western leg, far enough to include Tulagi, and 210 miles on the eastern leg, covering seventy-five miles to seaward of Malaita. In the event, this would probably have resulted in detection of the Japanese carrier force on 5 May. If the search had been conducted from Espiritu Santo Island, its radius would have reached the tip of Choiseul Island.¹⁵⁰

The divided theater command hampered significantly the ability to obtain comprehensive and timely information on the whereabouts and movements of the enemy forces both prior to and during the operation. MacArthur had sole responsibility for land-based aircraft operating over the Coral Sea. By decision of the Joint Chiefs of Staff, Nimitz was not allowed to intrude; the consequence was that a large part of the Coral Sea was not searched.¹⁵¹ Another problem was that Allied land-based aircraft crews were poorly trained for maritime reconnaissance. The long flying times because of the remoteness of bases and operating areas caused fatigue. Also, the number of land-based search aircraft was limited. For these reasons, during the operation CTF 17, Rear Admiral Fletcher, would be forced to supplement them with carrier-based planes.¹⁵²

ALLIED PLANS AND PREPARATIONS

Despite public statements that he was committed to the defense of Australia by holding New Guinea, MacArthur deployed only one brigade of militia to Port Moresby and sent no reinforcements until 14 May, when the battle of the Coral Sea was over, although he had four experienced Australian Imperial Force brigades and the U.S. 41st Division. The SWPA had to rely almost exclusively on land-based aircraft and naval forces to defend Port Moresby.¹⁵³

SWPA's Allied Air Forces elements under Lieutenant General George Brett (who had taken the post on 20 April 1942) consisted of six AAF air groups—three pursuit and one light bombardment, medium bombardment, and heavy bombardment each—and four RAAF squadrons. This force was impressive, but only on paper. There were about a hundred medium bombers and forty-eight heavy bombers, but fewer than half were operational.¹⁵⁴ Some units had escaped from the Philippines; the others were inexperienced. The entire force had great logistical difficulties. Squadrons were sometimes able to put no more than a single plane in the air. Out of about five hundred aircraft in the inventories, only about two hundred, or 40 percent of the entire force, could support the Coral Sea operation.¹⁵⁵

SWPA's Allied Naval Forces, under Vice Admiral Leary, were small and inadequate for defending Port Moresby from an enemy landing. Most of SWPA's surface forces were actually controlled by Fletcher. The submarine force consisted of eleven old S-class boats. Only four to six submarines could be sent on patrol at any given time; they were usually employed around Rabaul and off the eastern New Guinea coast.¹⁵⁶ The Australians were unable to hold their position in the

Solomons, because of the lack of air cover; they had at Tulagi only about fifty men and a seaplane base with four Catalinas, which patrolled out to New Britain and Bougainville. The Australians decided on 2 May to evacuate Tulagi after receiving warning from the coastwatchers that an enemy force was on the way from Rabaul.¹⁵⁷

In early April, Nimitz had only one carrier task force at sea—TF 17, with *Yorktown*, under Fletcher—in the eastern part of the Coral Sea. TF 11, with *Lexington*, had steamed into Pearl Harbor on 26 March. On 3 April, Rear Admiral Aubrey Fitch relieved Vice Admiral Brown as CTF 11. Nimitz directed Fitch to sail on 15 April and exercise near Palmyra. Four days later he informed Fletcher that he had taken over command of the SOPAC. Nimitz directed Fletcher to sail east to Tongatabu for replenishment. TF 17 would depart Tongatabu on 27 April back to the Coral Sea.

After the 10 March attack on shipping in the Huon Gulf, there were no significant actions by Allied carriers in the South Pacific. However, MacArthur wanted them to remain in the area. On 17 April, he expressed concern that carriers were leaving the Coral Sea for Tongatabu. He wrote to Nimitz, “[I] consider it necessary that one task force [be] maintained in that area at all times to check further enemy advance.” Nimitz was surprised at the message but assured MacArthur that TF 17 was being withdrawn only to replenish and deal with problems with its fighter aircraft. He strongly agreed on the desirability of maintaining a force in the Coral Sea and would try to do so. Nimitz privately told King, “It is my conviction that enemy advance should be opposed by [a] force containing not less than two carriers.” He again recommended to King that TF 11 be sent to the Coral Sea to join TF 17 for upkeep.¹⁵⁸

In January 1942 King and his staff planned a diversionary raid (later popularly known as the “Doolittle Raid”) on Japan to raise U.S. morale after the string of Allied defeats in the Pacific. From decoded enemy radio messages, the American planners knew that the Japanese carriers were still far to the south, but this diversionary raid tied up half of Nimitz’s carrier strength.

Halsey’s TF 16 (*Enterprise*, plus *Hornet*, attached for the Tokyo raid), was expected to return to Pearl Harbor on 25 April. It could sail to the South Pacific by the end of April and join Fletcher’s TF 17 on about 14 May. The only concern was whether *Hornet* would have its full complement of aircraft. TF 16 would operate with TF 17 and then relieve it when Fletcher left the South Pacific about 15 May, because *Yorktown* needed dry-docking and overhaul. *Lexington* could stay until 1 June, when it would go to Hawaii for dry-docking as well. The number of the Catalinas at Nouméa would be increased from six to twelve. SWPA would provide land-based air support. A group of cruisers and a half-dozen submarines

would be deployed from Hawaii to the South Pacific and five more to observe Truk.¹⁵⁹

Plans to counter the pending Japanese offensive against Port Moresby were prepared independently by the SWPA and POA staffs. On 4 April, an Australian study stressed that the key to the defense of Australia was Port Moresby.¹⁶⁰ After the Japanese occupation of Rabaul and points on the New Guinea coast MacArthur decided to strengthen Allied positions in New Guinea and develop Port Moresby as a major air and land base. Though, as noted, he sent no troops to Port Moresby, he directed expansion of air facilities in northeastern Australia, specifically at Townsville and Cloncurry, for its defense; this program was in its early stages in late April 1942. MacArthur also made extensive preparations to thwart the Japanese attempt to seize Port Moresby. Among other things, he directed SWPA's Allied Air Forces to intensify reconnaissance and concentrate striking forces at Townsville and Cloncurry airfields. He planned to conduct repeated air attacks against Rabaul in early May; long-range heavy bombers would also attack Lae, Deboyne Island, and convoys in adjacent areas. The garrison commanders in northeastern Australia and at Port Moresby were alerted to the possibility of the enemy landings. SWPA's Allied Naval Forces also sent three Australian cruisers, known as TF 44, under Rear Admiral John G. Crace (Royal Navy) to join with TF 17 in the Coral Sea.¹⁶¹

For its part, Nimitz's staff produced on 22 April a detailed estimate of the situation. Nimitz assumed that a Japanese offensive in the New Guinea–New Britain–Solomons area would begin about 3 May. For Nimitz the problem was how to stop the pending Japanese advance in the southwestern Pacific and yet ensure the security of Hawaii and the lines of communications with the West Coast. He delegated authority to conduct operations directly to Fletcher. When TF 16 arrived, Halsey would be in overall command.¹⁶²

The U.S. carrier groups in the Coral Sea did not have enough fleet oilers. The 21,077-ton and 16.5-knot *Neosho* carried 18,000 tons of oil, and the 16,800-ton and 10-knot *Tippecanoe*, 11,130 tons. There were also two oilers available in Australia but they were not equipped for underway replenishment. Carriers and their escorts consumed very large quantities of fuel, especially at high speed in combat. Fortunately, carriers and cruisers could carry sufficient amounts of fuel to give them long range and endurance. For example, *Yorktown* carried 7,500 tons of fuel, enough for seventeen days at twenty knots. But the 1,900-ton U.S. destroyers of 1942 carried only about five hundred tons of fuel, giving them an endurance at fifteen knots of about 4,700 miles, or thirteen days. At thirty-four knots—in combat action or when screening fast carriers—their endurance was only thirty-two hours, about 1,100 miles.¹⁶³ Carriers and cruisers often refueled

the short-legged destroyers and more quickly than oilers could, but the entire task group had to be withdrawn from the operating area.

This shortage of fleet oilers, which was true of the Pacific theater as a whole, was a major Allied weakness and vulnerability. Fletcher tried always to keep an oiler with his carrier group except during the strike operations. He was also greatly concerned that the Japanese not discover that he had only two fleet oilers. If the Japanese attacked them, U.S. carrier operations in the Coral Sea would be greatly restricted.¹⁶⁴

Compared to the Japanese plans, the Allied plan was simple and straightforward. The single and the most important objective was to prevent the enemy invasion forces from reaching and landing troops at Port Moresby. The prerequisite was to deny local control of the Coral Sea to the enemy. This objective could be accomplished by the destruction or neutralization of the enemy's greatest, and critical, strength, his carrier force—in modern terms, his operational center of gravity. Based on Nimitz's Operation Order 23-42 of 29 April 1942, Fletcher stated in his Operation Order 2-42 the mission of TF 17 was to destroy enemy ships, shipping, and aircraft at favorable opportunities in order to assist in checking further advances by the enemy in the New Guinea–Solomons area.¹⁶⁵ He also wrote, "This force will operate about seven hundred miles south of Rabaul. Upon receiving intelligence of enemy surface forces advancing to the southward, this force will move into a favorable position for intercepting and destroying the enemy."¹⁶⁶

An annex to the operation order contained information on the Japanese air strikes against Horn Island, Port Moresby, and Tulagi. It estimated the enemy's land-based air strength at 102 aircraft (forty-two fighters, thirty-six bombers), twenty flying boats, and four floatplanes). The enemy searches would, it assessed, extend up to six hundred miles from Rabaul and the Shortland Islands. Fletcher anticipated that the enemy offensive would start around 28 April.

Fletcher's operation order's estimate of the enemy's carrier forces was largely accurate. The frontline carriers *Zuikaku* and *Shōkaku* would have sixty-three aircraft each (twenty-one fighters, twenty-one dive-bombers, and twenty-one torpedo bombers). "*Ryūkaku*" was falsely estimated to carry eighty-four aircraft (twenty-one fighters, forty-two dive-bombers, and twenty-one torpedo bombers); the air complement of the actual *Shōhō* was much smaller. In addition, it was believed that the (17,400 ton) converted carrier *Kasuga Maru* would be present, carrying some forty-five aircraft. These forces were supported, the order stated, by two heavy cruisers, three light cruisers, sixteen destroyers, two converted seaplane tenders, one submarine tender, six submarines, eight gunboats, and nineteen transports and auxiliary vessels.¹⁶⁷

EXECUTION

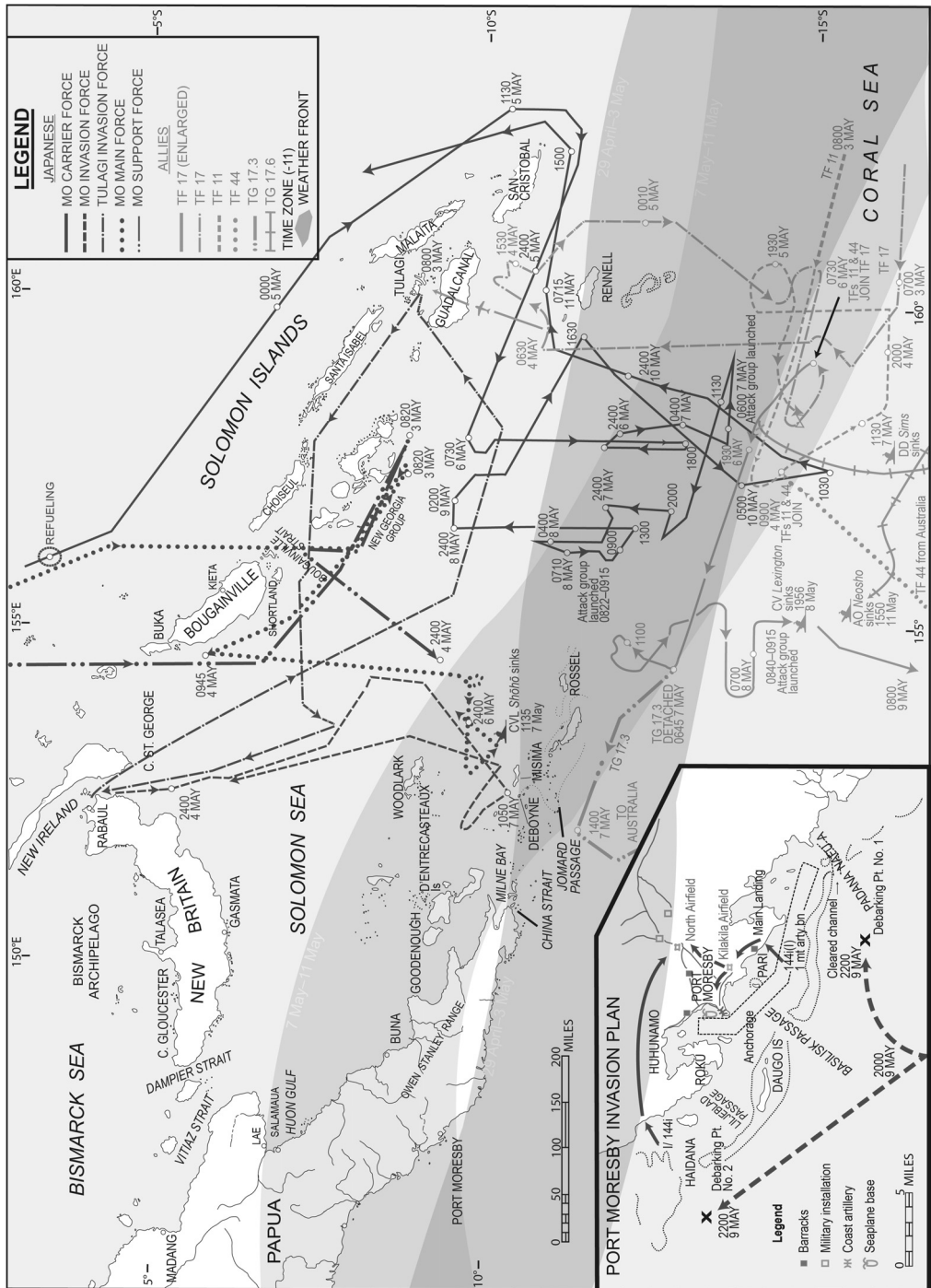
The Port Moresby–Solomons operation was executed between 28 April, when the first Japanese force element was deployed, and 11 May, when the Japanese decided to abandon pursuit of TF 17. Combat took place between 3 and 8 May, and the decision was reached in a carrier engagement on 8 May (see map 3). In the process both sides made numerous errors in identifying opposing forces. Many wrong decisions were made, either because the commander received incorrect information on the whereabouts and movements of enemy forces or because he lacked that information entirely or exercised poor judgment.

The major combat involved in the operation can be arbitrarily divided into three phases. Phase I was the deployment of combat forces and the Japanese landing on Tulagi (27 April–3 May), II the Allied attack on Tulagi and preliminaries (4–7 May), and III the carrier engagement and withdrawal of forces (8–11 May).

Phase I (27 April–3 May)

The Japanese forces deployed for the Port Moresby–Solomons operation in nine force elements, each proceeding toward its assigned area independently. On 29 April four submarines of SubRon 8 (*I-22*, *I-24*, *I-28*, and *I-29*) left Rabaul and headed to their assigned patrol area some 285 miles southwest of Guadalcanal; another submarine (*I-21*) took up a station off Nouméa; in early May, two boats of SubGru 21 (*RO-33* and *RO-34*) sailed out of Rabaul for the waters south of Osprey Reef, some 205 miles north-northeast of Cairns, Australia; they were then to proceed to the approaches off Port Moresby.¹⁶⁸ On 29 April, the MO Support Force sailed from Truk southward to pass west of Buka Island and then turn south and eastward toward a position west of Tulagi. The next day the MO Main Force sortied from Truk, steaming southward toward the passage between Bougainville and Choiseul and then eastward toward a position some 150 miles west of Tulagi. The Tulagi Invasion Force, with about four hundred troops of the 3rd Kure Special Naval Landing Force, sortied from Rabaul on 29–30 April. The MO Carrier Force sailed from Truk on 1 May to pass eastward of San Cristobal and enter the Coral Sea. Finally, on 4 May, the MO Invasion Force, with five thousand troops of the South Seas Force and five hundred of the 3rd Kure Special Naval Landing Force, sailed from Rabaul and proceeded southward toward Jomard Passage.

On the Allied side, TF 17 spent seven days at Tongatabu for provisioning and upkeep. It sailed out of Tongatabu on 27 April and three days later reentered the Coral Sea. In the meantime TF 11 left Pearl Harbor for the South Pacific. At 0615 on 1 May TF 17 and TF 11 met some three hundred miles southwest of the New Hebrides. TF 17 and TF 11 were vulnerable there to surprise enemy attack, because, as noted, Allied land-based patrol aircraft did not cover the central and



eastern parts of the Coral Sea and there was no coverage of a potential approach by the enemy carrier forces eastward of the Solomon Islands.¹⁶⁹ Fletcher sent TF 11 to join the oiler *Tippecanoe*, with the cruiser *Chicago* and destroyer *Perkins*, at latitude 16° 00' south, longitude 161° 45' east; take as much fuel as possible from *Tippecanoe* before the oiler returned to Efate as directed by Nimitz; and then rejoin TF 17 the next morning. Fletcher wanted to have as much fuel as possible on *Neosho* as a reserve.¹⁷⁰

Allied cryptanalysts continued to provide valuable information to Nimitz, Fletcher, and Fitch. For example, on 29 April, COM 14 decoded several messages sent by the Fourth Fleet clearly indicating that the MO operation was under way. Fourth Fleet's Operation Order 13 was read in its entirety. It stated that the objective of the MO operation was, first, "to restrict the enemy's movements and [this] will be accomplished by means of attacks on outlying units and various areas along the north coast of Australia. The Imperial Navy will operate to its utmost until this is accomplished. Further we will continue to operate against all bases used by enemy aircraft."¹⁷¹

The MO Carrier Force had been tasked to ferry eighteen Zero fighter aircraft from Truk to Rabaul, flying them in on 2 May. However, unforeseen events caused this simple task to disrupt the timetable for the entire operation.¹⁷² Everything went according to plan until 2 May, when the MO Carrier Force reached a position about 240 miles northeast of Rabaul. That day and the next, Takagi tried to launch Zeros; both attempts failed because of bad weather, which also prevented the carriers from refueling. Takagi then decided to refuel on the 4th and make a third attempt (which was apparently successful) before resuming his southerly advance. The loss of two days derailed the meticulous synchronization of the plan.¹⁷³ As it turned out, the MO Carrier Force could not be within range to protect Tulagi until 5 May, too late to have any real impact on the situation.¹⁷⁴

In the morning of 2 May, TF 17 completed refueling from *Neosho*, but Fletcher was disappointed to receive a message from Fitch that TF 11 would not complete refueling until noon on 4 May. Fletcher also learned, from MacArthur's dispatches, that the enemy was making final preparations for the advance on Port Moresby. Because his own force was too far away, he directed Fitch to fuel his destroyers on a northwesterly course at night and rejoin TF 17 at daylight, 4 May, at latitude 15° 00' south, longitude 157° 00' east. Task Force 44 was also to join TF 17 at that point (see sidebar, "Allied Task Organization").¹⁷⁵

At about 0800 on 3 May, the Japanese forces landed at Tulagi. The MO Support Force set up a direct screen, while the MO Main Force provided distant cover to the Tulagi Invasion Force. By dawn on 3 May, the MO Main Force was about 180 miles west of Tulagi. The aircraft from *Shōhō* supported the invasion. However, Gotō was unable to stay in the area very long, because he had to support

the MO Invasion Force.¹⁷⁶ Hence, his force moved at about 1100 on 3 May on a northwesterly course toward Queen Caroline Harbor, Buka Island, for refueling. The MO Support Force was then located about sixty miles west of the MO Main Force and was on the way to join the MO Invasion Force, then preparing to sail out of Rabaul. The MO Carrier Force was about 210 miles northeast of New Ireland and about 630 miles northwest of Tulagi, and sailing on a southeasterly course.¹⁷⁷

At about 0800 on 3 May TF 17 was at 16° 43' south, 159° 24' east (or about five hundred miles south from Tulagi), on a northwesterly course, while TF 11 was at 16° 26' south, 161° 50' east, on a westerly heading. The distance between these two forces was about a hundred miles. Fletcher for some reason did not think it necessary to combine TF 17 and TF 11 into a single force. This is somewhat surprising, because Nimitz had directed him to combine them, at Point BUTTERCUP, some 320 miles south of San Cristobal Island. Fletcher had received information that the enemy would probably start his operation by 28 April, and he knew about the presence of CarDiv 5 at Truk. He should have also assumed that the enemy's highest priority would be to cover his landing forces with his air and surface forces. With TF 11 and TF 17 as a single force, Fletcher could have delivered a much more powerful attack against the Japanese forces that landed in Tulagi. TF 11 had completed refueling early and was ready for action, but that was apparently unknown to Fletcher. The two forces were beyond visual distance, and it was not desirable to break radio silence.¹⁷⁸

At 1900 on 3 May, Fletcher received a message from MacArthur, who informed him about the presence of five or six enemy ships at 1700 (five in the afternoon) on 2 May off the southern tip of Santa Isabel Island, possibly moving toward Tulagi. MacArthur also stated that two enemy transports had sighted barges unloading at Tulagi, at an "unspecified time." Fletcher now regretted that the entire force was not combined and able to deliver a powerful strike at daylight the next day.¹⁷⁹

Phase II (4–7 May)

This phase of the operation began with the Allied carrier attack on Tulagi on 4 May. Afterward, and for the next three days, the opposing carrier forces tried to locate each other. They misidentified ships they sighted, and that led to strikes against unintended targets. However, by the end of 7 May each side knew the location of the other and was prepared for the decisive carrier engagement the next day.

The MO Invasion Force, escorted by one light cruiser and six destroyers, left Rabaul on 4 May and sailed southward. It planned to transit the Jomard Passage around midnight on 6–7 May and sail around the tip of Papua New Guinea

toward Port Moresby.¹⁸⁰ After withdrawal of both the MO Main Force and the MO Support Force, the Tulagi Invasion Force was left without any cover. Yet this seemed to the Japanese not to pose any immediate danger, because they expected no enemy reaction to their landing at Tulagi. In any case, CarDiv 5 was supposed to be about 120 miles north of Tulagi and from there would be able to cover it. Unfortunately, for the Japanese, Takagi's force, having been delayed ferrying Zeros to Rabaul, was actually 340 miles north of Tulagi.¹⁸¹

By 0700 on 4 May, TF 17 arrived at position 11° 10' south, 158° 49' east, or about 150 miles southwest of Tulagi. At about 0630, *Yorktown* launched the first of three strikes against the enemy ships at Tulagi and positions ashore. The first-wave attack took place between 0815 and 0830. By about 0900, TF 11 and TF 44 were joined at a position of about 250 miles south of TF 17.¹⁸² *Yorktown's* second-wave attack was conducted between 1210 and 1410, and the third between 1500 and 1515.¹⁸³ Some sixty aircraft in all took part in these strikes. Despite a large number of bombs and torpedoes dropped, the results were disappointing. Only a single enemy destroyer, one auxiliary, and two special-duty minesweepers were sunk; four other ships were damaged.¹⁸⁴ The remaining enemy transports, minelayers, and one destroyer immediately left Tulagi harbor.¹⁸⁵ The Japanese lost five seaplanes, while the Allies lost three aircraft and eight others were damaged.¹⁸⁶ Despite damage inflicted, the Japanese continued to build their seaplane base, which became operational on 6 May and conducted its first reconnaissance flights.

After receiving a report on the enemy's attack on Tulagi, Takagi stopped the refueling and directed his force to sail southeast and search for the enemy carriers in the Solomons area. These searches were unsuccessful. The Japanese were greatly surprised by the attack on Tulagi. Until then, as noted, they had firmly believed that the enemy would be forced to react to their moves; they now learned that the situation was the other way around.¹⁸⁷

On 5 May Nimitz informed Fletcher and Fitch about reliable information as of 3 May that the "Orange [i.e., Japanese] Moresby Striking Force composed of CruDiv 5 and CarDiv 5 will launch attacks on the Allied bases Port Moresby areas on X-Ray minus 3 or minus 2 days. These attacks will be launched from the southeast. X-Ray day is not known but one indication points to 10 May. Above attacks to be carried out until successful completion by Orange."¹⁸⁸ The Allied commanders also learned that the MO Carrier Force would be joined by the Tulagi Invasion Force at 1400 (2 PM) on 6 May. The combined formation would leave the Coral Sea at about 1800 on 7 May and steam south of Emerald Reef, Milne Bay.¹⁸⁹ After receiving this message, Fletcher decided to start refueling, move toward the Louisiades the next day, and fight a carrier engagement on the

7th.¹⁹⁰ Both Fletcher's carrier groups sailed on a westerly course; Crace's TF 44 was about fifty miles ahead.

The ships of TF 17 sailing on southwesterly courses were refueled by *Neosho* on 5 and 6 May. At 0735 on 6 May, Fletcher put his Operation Order 2-42 in effect.¹⁹¹ His task organization combined Task Forces 17, 11, and 44 into an enlarged TF 17, which now consisted of two large carriers, seven heavy cruisers, one light cruiser, thirteen destroyers, two fleet tankers, and a seaplane tender. Tactically, it was divided into five groups (see sidebar, "Allied Task Organization").¹⁹² Task Group (TG) 17.2 had a dual mission of operating against the Japanese force advancing southward and protecting the carriers against air and submarine attacks. The main task of TG 17.3 was to defend the carriers. These two groups were so organized that they could, depending on the situation, carry out each other's missions. Fletcher believed that four destroyers screening each carrier provided sufficient protection.¹⁹³ Because he was senior to Fletcher and the more experienced aviator, Fitch became officer in tactical control of all air operations. The enlarged TF 17 would operate generally in the Coral Sea about seven hundred miles south of Rabaul, outside the range of Japanese land-based aircraft.¹⁹⁴

In the early morning of 6 May Takagi's carrier force was about 120 miles southwest of the western tip of Guadalcanal. At that point a flying boat from Tulagi detected the U.S. task force and accurately reported its position. Headquarters in Rabaul received the report and relayed it to Takagi. Allied cryptanalysts picked up the signal;¹⁹⁵ Takagi, however, would not receive this information until 7 May.¹⁹⁶ Meanwhile, on the 6th, Takagi started refueling his ships in preparation for a carrier engagement the next day.¹⁹⁷

At about 1030 four B-17s from Cloncurry and staged through Port Moresby unsuccessfully attacked *Shōhō* some sixty miles south of Bougainville. About 1300, Allied search aircraft detected the MO Invasion Force sailing southward toward Jomard Passage.¹⁹⁸

In the meantime, at about 1000, a reconnaissance flying boat from Tulagi detected TF 17. Takagi received that report about 1050; his force was now about three hundred miles north of TF 17, still refueling. He sent both carriers, with two destroyers, southward at twenty knots to reduce the distance to the enemy carrier force. However, according to Japanese reports, Takagi decided that the chance to attack had been lost and turned north at 1800 to await another opportunity the following day.¹⁹⁹ At that point the presence of Takagi's force some seventy miles north of TF 17 was unknown to Fletcher. The Japanese carriers were shielded by the overcast of a cold front and search aircraft had failed to detect them. Takagi, for his part, failed to carry out long-range searches on either 5 or 6 May.²⁰⁰

ALLIED TASK ORGANIZATION

POA FORCES

(Adm. Chester W. Nimitz, CINCPac, Pearl Harbor)

Task Force 17

(Rear Adm. Frank Jack Fletcher, Yorktown)

TG 17.2 (Attack Group, Rear Adm. Thomas C. Kinkaid)

TU 17.2.1 (2 CAs—*Minneapolis*, *New Orleans*)

TU 17.2.2 (3 CAs—*Astoria*, *Chester*, *CA-33 Portland*)

TU 17.2.4 (5 DDs—*Phelps*, *Dewey*, *Farragut*, *Aylwyn*, *Monaghan*)

TG 17.3 (Support Group, Rear Adm. John G. Crace)

17.3.1 (2 CAs—HMAS *Australia*, *Chicago*; 1 CL—HMAS *Hobart*)

17.3.4 (2 DDs—*Perkins*, *Walke*)

TG 17.5 (Air Group, Rear Adm. Aubrey W. Fitch)

TU 17.5.1 (2 CVs—*Yorktown*, *Lexington*)

(*Yorktown*—17 F4F Wildcat fighters, 18 SBD-2 Dauntless dive-bombers, 13 TBD-1 Devastator torpedo bombers)

(*Lexington*—21 F4F Wildcat fighters, 18 SBD-2 Dauntless dive-bombers; 17 SBD-2 Dauntless dive-bombers [scouts], 12 TBD-1 Devastator torpedo bombers)

TU 17.5.4 (4 DDs—*Morris*, *Anderson*, *Hamman*, *Russell*)

TG 17.6 (Fueling Group)

2 AOs (*Neosho*, *Tippecanoe*)

2 DDs (*Sims*, *Worden*)

TG 17.9 (Search Group)

1 AV (*Tangier*)

VP-71 (6 PBV-5s)

VP-72 (6 PBV-5s)

SWPA FORCES

(Gen. Douglas MacArthur, Brisbane)

Allied Naval Forces

(Vice Adm. Herbert F. Leary)

TF 42 Eastern Australia Submarine Group

(Rear Adm. Francis W. Rockwell)

Task Group 42.1 (Capt. Ralph Waldo Christie)

1 AS (*Griffin*, at Brisbane)

SubDiv 53 (*S-44*, *S-45*, *S-46*, *S-47*)

SubDiv 201 (*S-37*, *S-38*, *S-39*, *S-40*, *S-41*)

TF 44

(Rear Adm. John G. Crace, RN; temporarily assigned to TF 17)

1 CA (HMAS *Australia*)

1 CL (HMAS *Hobart*)

Allied Air Forces

(Lt. Gen. George H. Brett, Melbourne)

3rd Bombardment Group (light) (Charters Towers) 52 bombers (19 B-25s; 19 A-24s; 14 A-20s)

8th Light Bombardment Squadron

13th Light Bombardment Squadron

90th Light Bombardment Squadron

22nd Bombardment Group (medium) (Townsville Area) 92 bombers (12 B-25s, 80 B-26s)

90th Light Bombardment Squadron

13th Light Bombardment Squadron

19th Bombardment Group (heavy) (Cloncurry) 48 B-17s

30th Bombardment Squadron

40th Reconnaissance Squadron

93rd Bombardment Squadron

435th Bombardment Squadron

8th Pursuit Group (Townsville Area; Port Moresby) 100 fighters (50 P-39s each)

35th Fighter Squadron

36th Fighter Squadron

35th Pursuit Group (Sydney) 100 fighters (P-39s/P-38s)

49th Pursuit Group (Darwin) 90 fighters (P-40s)

7th Fighter Squadron

8th Fighter Squadron

9th Fighter Squadron

Photographic Squadron; 4 aircraft Flight A, 8th Bombardment Squadron

ROYAL AUSTRALIAN AIR FORCE

No. 11/20 Squadrons (Gavutu-Tanambogo, Tulagi) 4 PBV-5 Catalinas

(withdrawn on 2 May 1942)

No. 24 Squadron (Townsville) 3 Wirraways (trainers used as fighters)

No. 32 Squadron (Port Moresby) Hudson bombers

No. 75 Squadron (Port Moresby) 3 P-40s

TULAGI

2/1 Independent Company, Australian Imperial Force (24 commandos)

(withdrawn on 2 May 1942)

PORT MORESBY

Garrison

(Maj. Gen. B. M. Morris, some 5,000 troops)

39th Infantry Bn.

49th Infantry Bn.

53rd Infantry Bn.

13th Field Regt.

23rd Heavy AA Battery

Detachment, 1st Independent Co.

30th Infantry Bde. Signal Section

30th Infantry Bde. HQ Defense Platoon

Fixed Defenses

Moresby Fixed Defenses Fortress Engineers

Moresby Fixed Defenses AA Artillery (six 3-inch guns)

1st Army Troops Co.

7th Field Co.

New Guinea Volunteer Rifles

Papuan Infantry Bn.

8th Military District Section Intelligence Corps

15th Supply Personnel Co.

Base Hospital

Sources: Bates et al., *Battle of the Coral Sea*, app. 2, table 1; Coulthard-Clark, "RAN and RAAF Involvement in the Battle of the Coral Sea," p. 66.

On 6 May *Kamikawa Maru* of the MO Support Force was detached at Deboyne Island to establish a seaplane base there; that base became operational the next day. Afterward, the MO Support Force withdrew to the vicinity of the D'Entrecasteaux Islands to protect the right flank of the MO Invasion Force.²⁰¹ By midnight on 6–7 May, the MO Invasion Force was northward of Misima Island; the MO Main Force, with *Shōhō*, was some ninety miles northeast of Deboyne Island.²⁰²

At 0625 on 7 May, TF 17 was about 115 nautical miles south of Rossel Island. Fletcher wrote in his postaction report that he planned for the morning air

search on the 7th to locate the most suitable objective for attack and obtain positive or negative information regarding enemy carriers, on which he had obtained no information since the previous afternoon. However, searches to the east and northeastward were not completed, due to bad weather.²⁰³

During the night of 6 May, Fletcher received reports from SWPA land-based aircraft of the enemy transports and light cruisers heading toward Jomard Passage. For this reason he directed, at 0645 on 7 May, Crace's TG 17.3 plus the destroyer *Farragut* to proceed northward and block the Jomard Passage.²⁰⁴ As TG 17.3 approached, a Japanese seaplane detected it, mistakenly reporting "one battleship, two heavy cruisers and three destroyers." At about 1430, TG 17.3 was attacked by twelve torpedo bombers and nineteen land-attack aircraft from Rabaul. All these attacks were skillfully avoided by the Allied ships.²⁰⁵ Crace's force was also mistakenly attacked by three high-level B-17 heavy bombers, but all their bombs fortunately missed their intended targets.²⁰⁶

At 1526, Crace reported to Fletcher that he was unable to complete his mission without air cover and would withdraw to a position some 220 miles southeast of Port Moresby. From there TG 17.3 would be able to intercept any enemy force exiting the Louisiades and advancing toward Port Moresby. TG 17.3's ships were low on fuel. Crace also did not have information on the location of TF 17 or know Fletcher's intentions. Nonetheless, because of TG 17.3's presence Inoue ordered the invasion convoy to loiter north of the Jomard Passage and await the outcome of the pending carrier battle.²⁰⁷

Fletcher had been well aware that Crace would be operating without air cover, but he intended that the enemy convoy not slip through the Jomard Passage and reach Port Moresby. Fletcher later explained that he sent Crace north to ensure that the invasion was thwarted even if the enemy carriers finished off TF 17 in the expected duel.²⁰⁸ Fletcher would also claim, in an interview after the war, that he "feared the opposing carriers would quickly neutralize each other," recalling the examples of "many prewar tactical exercises." In his view, Crace's group would be able to prevent the enemy invasion force from exiting the Jomard Passage whether the Allied carriers intervened or not.²⁰⁹

Nonetheless, Fletcher made a wrong decision in detaching TG 17.3. It was too risky to employ a surface force without air cover in an area known to be within effective range of enemy land-based aircraft. It was pure luck (notwithstanding the skill of his ships) that Crace's force was not seriously damaged or destroyed; Fletcher had no way of knowing what would happen. Also, by detaching Crace's force Fletcher seriously weakened the AA and antisubmarine warfare (ASW) defense of his carriers, which would in today's terms be called the "friendly operational center of gravity." With the detachment of an additional destroyer during the night of 7–8 May, TF 17 was left with twelve instead of nineteen escorts for

the decisive engagement that occurred on the 8th.²¹⁰ Had TF 17's carriers been destroyed, the enemy would have had no difficulty destroying TG 17.3 as well.

In the morning on the 7th, Takagi still did not know the whereabouts of the enemy naval force. He made a decision, based on Admiral Hara's recommendation, to search the area southward to make sure that no enemy carrier force was in his rear as he moved westward to provide cover for the MO Invasion Force.²¹¹ Both the Japanese land-based and carrier search aircraft misidentified enemy ships on several occasions that morning. For example, at 0522, a Japanese land-based aircraft reported the presence of one enemy carrier about 460 miles southwest of Tulagi. At 0640, a seaplane reported "one battleship, one cruiser, seven destroyers, and what looks like one aircraft carrier" about ninety-five miles south of Rossel Island.²¹² At 0722, an aircraft from *Shōkaku* reported enemy ships about 160 miles away; this was actually TG 17.6, the Fueling Group, *Neosho* and the destroyer *Sims*, misidentified as one cruiser and three destroyers. At 0800, without waiting to confirm the accuracy of the report, Hara launched seventy-eight aircraft (eighteen fighters, thirty-six dive-bombers, and twenty-four torpedo bombers). At 0915, they sighted *Neosho* and *Sims* and attacked, twelve torpedo bombers with fighters in the first wave, followed by twenty-six heavy bombers.²¹³ At 1051, *Shōkaku's* pilots realized the mistake in identification, but it was too late. *Neosho* was hit by seven bombs and, heavily damaged, later sank; *Sims* was hit by three bombs and sank immediately.

Fletcher believed that the enemy carrier force was somewhere north of his force near the Louisiades. Actually, Takagi's force was about three hundred miles east of TF 17. At 0619 he directed *Yorktown* to launch ten dive-bombers as scouts. About 0815, *Yorktown* search aircraft reported "two carriers and four heavy cruisers" a short distance northeast of Misima Island, or some 175 miles northwest of the Allied carriers. Fletcher immediately decided to launch an all-out attack against these ships. By 1000 ninety-three aircraft (fifty-three dive-bombers, twenty-two torpedo bombers, and eighteen fighters) were airborne. At that time, his carriers were in the weather front, hidden by overcast, while Gotō's force, which he had just detected, was in broad sunlight. However, after the Allied aircraft were airborne it was discovered that this report had been improperly decoded: the pilot had actually observed only two enemy heavy cruisers and two destroyers, in addition to the reported carrier.²¹⁴ The attack groups from both *Yorktown* and *Lexington* were directed to attack what proved to be *Shōhō*.²¹⁵

At 1055 *Shōhō*, defended by only about eight fighters and surrounded by cruisers, was attacked by the Allied aircraft from both carriers.²¹⁶ *Shōhō* was hit with seventeen bombs and five torpedoes. It sank at 1135. Fifteen out of its twenty-one aircraft went down with it; 638 men were killed and seventy-three wounded—Japanese destroyers rescued about a hundred men. The Allies lost

only three aircraft.²¹⁷ Despite the success in sinking *Shōhō*, the Allied aircraft should have also attacked other ships in Gotō's force and thereby inflicted much higher losses, but they did not. Instead they returned to their carriers about 1340; within an hour all were rearmed and ready for action. But Fletcher was still in the dark as to the whereabouts of the enemy carrier force. Even if it had been sighted that afternoon, it would have been too late to launch a successful day attack. He decided to turn southwest and mount a strike the next day.

Shortly after 1500 Takagi received an erroneous report from a seaplane based on Deboyne that the enemy carrier force (actually TG 17.3) had changed course to the southeast. Hence, at 1515, Hara sent eight bombers to confirm the report by searching two-hundred-nautical-mile sectors to the west of the Japanese carriers. However, before hearing from them, Hara hastily made an unsound decision to launch an attack on the supposed enemy carrier group; at 1615 he sent twelve dive-bombers and fifteen torpedo bombers with his most experienced pilots and crews to search westward out to 280 miles. In the meantime the first group of aircraft returned without having found the enemy ships. At 1747, *Yorktown*'s radar detected the second group; at that time the Japanese carriers were some two hundred miles east of TF 17. *Yorktown*'s eleven fighters were vectored to intercept the incoming Japanese aircraft. In the ensuing dogfights, nine enemy aircraft were shot down and one was damaged, while the Allies lost three. The Japanese pilots now became disoriented and lost their way; at about 1900 (7 PM), six tried to land on *Yorktown*, mistaking it for their own carrier until they encountered AA fire and turned away. In addition, eleven aircraft were lost trying to make night landings on the Japanese carriers.²¹⁸ By 2000 (8 PM) on 7 May, when the last Japanese aircraft landed, the opposing carrier forces were only about a hundred nautical miles apart.

Phase III (8–11 May)

The two opposing carrier forces did not detect each other until the morning of 8 May. At about 0615, the Japanese carrier force was about 140 miles east of Rossel Island. Hara launched seven torpedo bombers to search from southeast to southwest out to 250 miles; several aircraft from Rabaul and Tulagi assisted. CarDiv 5's screen was reinforced by two heavy cruisers from Gotō's force. The MO Invasion Force was directed to steam to a position forty miles east of Woodlark Island and await the outcome of the coming battle.

At 0635, Fitch launched eighteen bombers to search in all directions out to about two hundred nautical miles. The Allied carriers were under mostly clear skies; visibility was about seventeen miles. In contrast, the enemy carriers were now under a warm frontal zone, with low-hanging clouds and heavy overcast; visibility varied from two to fifteen miles. Nonetheless, *Lexington*'s aircraft

sighted the enemy carriers at about 0820, and a few minutes later the Japanese aircraft spotted the American ones. The opposing carriers were then about 210 nautical miles from each other. The two sides were almost even in strength; the Allied carriers had 126 aircraft (118 were operational), while the Japanese had 121. The Japanese carriers had a screen of four heavy cruisers and six destroyers, while the American carriers had five heavy cruisers and seven destroyers.

Between 0822 and 0915, the Japanese carriers launched a combined strike group of sixty-nine aircraft (eighteen fighters, thirty-three dive-bombers, and eighteen torpedo bombers). In contrast, the Allied carriers launched their strikes separately. From 0840 through 0915, *Yorktown* sent forty-one aircraft, and all but four reached their targets. *Lexington* launched within the same time frame forty-three aircraft.²¹⁹ *Yorktown*'s dive-bombers arrived first over the Japanese carriers but had to wait for the torpedo bombers. *Shōkaku* and the *Zuikaku* were about ten thousand yards apart, hidden under a rainsquall. They were protected by about sixteen fighters. *Yorktown*'s aircraft did not find *Zuikaku* and focused all their attention on *Shōkaku*, attacking at 1100. The torpedo bombers failed to achieve any hits.²²⁰ *Yorktown*'s dive-bombers obtained only two bomb hits;²²¹ however, one of them rendered *Shōkaku* unable to launch aircraft. *Lexington*'s aircraft arrived over their targets at 1130; two dive-bombers attacked *Shōkaku* and scored one hit; two other dive-bombers attacked *Zuikaku* but missed. About half of fifty-two aircraft from *Lexington* did not find the enemy carriers.²²²

In the meantime, at 1044, the Japanese aircraft attacked the Allied carriers. *Lexington*'s radar detected the enemy aircraft at a range of about seventy miles, and nine fighters were sent to intercept. However, six of them flew too low and missed the enemy aircraft. The Allied carriers were about three thousand yards apart. At 1113 the Japanese started their attack, giving most of their attention to *Lexington*. *Yorktown* received one bomb hit, but *Lexington* was struck by two torpedoes and two bombs.²²³ *Lexington* was heavily damaged and unsalvageable; it was sunk by a destroyer that evening to prevent it from falling into enemy hands.²²⁴ After the end of the engagement, the Allied carriers were left with at least forty-nine operational aircraft, while the Japanese had only thirty-nine available to fight the next day.²²⁵

Takagi mistakenly believed that both enemy carriers were sinking and so decided in the early afternoon that he could send the damaged *Shōkaku* back to Truk.²²⁶ He was not entirely wrong in doing so. As Takagi and Hara informed Inoue, they were unable to launch a second strike that afternoon, or probably the next day either, for reasons of low aircraft strength, pilot fatigue, and low fuel in the screening ships. Because of the repeated interruptions between 4 and 8 May,

the MO Carrier Force had never fully refueled; some destroyers had only 20 percent of their fuel capacity remaining, the rest of them 40 percent.²²⁷

In late afternoon on 8 May, Inoue and his staff made a detailed estimate of the situation. Only *Zuikaku* was left undamaged, and it had only half its aircraft. In his view, the enemy had lost one carrier and probably another. The question for Inoue was whether the MO Invasion Force could proceed to Port Moresby. He believed that a single weakened carrier air group was incapable of protecting it from the enemy land-based aircraft in Australia. Also, Japanese forces needed to regroup. Inoue decided to delay the attack on Port Moresby until 3 July. Hence, he directed the MO Invasion Force to return to Rabaul. Inoue also decided to hold Tulagi but to abandon the seaplane base at Deboyne as untenable for the time being.²²⁸

Inoue's decision greatly angered Yamamoto, who was convinced that the Japanese had sunk two enemy carriers and won the battle. Yamamoto did not know that the Japanese carriers had few aircraft remaining and hence saw no reason why the operation should not continue. However, he could do nothing about the postponement of the landing at Port Moresby, but he did not want the enemy naval forces to escape; he ordered Inoue to resume his pursuit and "annihilate the remaining enemy force." At about 2300 on 8 May, Inoue directed Takagi and Gotō to resume their pursuit. At 0200 the next day, *Zuikaku* and its escorts changed the course to the southeast and then southwest. About one hour later Gotō's force was joined by *Zuikaku*'s group. Shortly afterward, Inoue changed his mind again and directed both groups to reverse course and head northward. On 11 May, Takagi received the orders to leave the area entirely.²²⁹ The Port Moresby–Solomons operation was over.

AFTERMATH AND ASSESSMENT

After the loss of *Lexington*, TF 17 sailed southward to regroup. On the morning of 9 May a scout plane from *Yorktown* sighted the enemy carrier force 175 miles to the northwest. Fletcher prepared his force for possible enemy attack and launched a strike. He also asked for help from SWPA air forces. Brett responded by sending fourteen bombers, which reached the targets at the same time as the *Yorktown* group. However, the target proved to be a reef. That afternoon Nimitz directed Fletcher to return to Pearl Harbor or the West Coast with both carriers (Nimitz had not yet been informed of the loss of *Lexington*) and the screening ships of the original TF 17 (i.e., before its enlargement). Kinkaid's TG 17.2 would join TF 16. The same day, Fletcher detached Crace's force and brought TF 44 back into existence. Afterward, TF 44 proceeded to Brisbane for refueling.²³⁰ On 10 May, Fletcher informed Nimitz that he planned to stop at Tongatabu on the way to Pearl Harbor.²³¹

The Allies now learned from reading enemy messages that the Port Moresby operation had been postponed, that the Port Moresby occupation force would return to Rabaul, and that CruDiv 5 and CarDiv 5 would refuel in the Bougainville area and then cover the occupation of Ocean and Nauru islands. CruDiv 6, with two heavy cruisers of the *Aoba* class, plus gunboats and destroyers, would support the Nauru–Ocean Island invasion.²³² Fletcher did not respond to these movements. At 1600 on 11 May, he detached Kinkaid to Nouméa, while one heavy cruiser was to rejoin TF 17 at Tongatabu.²³³

TF 16, with *Enterprise* and *Hornet*, sailed out of Pearl Harbor on 30 April for the Coral Sea but did not reach the scene of action in time. Instead, TF 16 made a feint toward Nauru and Ocean Island. On 15 May, Inoue received a report from the search aircraft about the presence of the enemy carriers some 450 miles east of Tulagi. Shortly afterward, he directed the Nauru–Ocean Island Invasion Force to return to Truk (these two islands were eventually captured by the Japanese on 25–26 August 1942).²³⁴ On 16 May, TF 16 reversed its course toward Pearl Harbor and arrived there ten days later.

The battle of the Coral Sea was the first in which surface ships did not see each other and so did not have the opportunity to use their guns or torpedoes. All losses on both sides were caused by air strikes. The Japanese sank a fleet oiler and a destroyer and so heavily damaged a large carrier that it had to be sunk. The Japanese lost only one small carrier and a few small ships at Tulagi. They also lost sixty-nine aircraft (twelve fighters, twenty-seven dive-bombers, and thirty torpedo bombers) and 1,074 men; the Allies lost sixty-six aircraft and 543 men.²³⁵ One Japanese large carrier was heavily damaged, and the losses of aircraft and experienced pilots were hard to replace; CarDiv 5 did not rejoin the fleet for more than two months.²³⁶ Nonetheless, the Japanese achieved a clear tactical victory. Operational victory belonged to the Allies, because the Japanese attempt to capture Port Moresby by sea was stopped and the entire operation delayed. Further, the damage inflicted on *Shōkaku* and losses to *Zuikaku*'s air wing prevented both carriers from taking part in the Midway–Aleutians operation the next month. Had they been available then, the chances of Allied victory would have been much lower. After Midway, the Japanese decided to seize Port Moresby by land, across the Owen Stanley Range; that attempt ultimately failed.

CONCLUSION AND OPERATIONAL LESSONS LEARNED

The Japanese strategic decision in January 1942 to expand Japan's defensive perimeter in the aftermath of its initial great successes in the Pacific War was due to what has been called "victory disease." The Japanese were surprised by their quick victories and low losses. The leaders of the IJN were far more aggressive than those of the army in wishing to exploit early successes by

preventing the enemy from gaining time and mounting a counteroffensive. Yamamoto was keenly aware that decisive victory against the U.S. Pacific Fleet was the key to consolidating Japanese strategic success before the industrial power of the United States became overwhelming. In trying to expand Japan's defensive lines in the Pacific and the Indian Ocean, however, naval and army leaders clearly did not match their strategic ends and means. Differences between the Naval General Staff and the Combined Fleet on whether the main thrust in the Second Operational Stage of the war should be in the South, Central, or North Pacific resulted in a bad compromise plan. The subsequent changes in timing of the Port Moresby–Solomons and Midway–Aleutians operations, coupled with Yamamoto's inability to assign adequate forces to either major operation, were perhaps the main reason that both ultimately failed. A major problem for the Japanese was the lack of centralized planning at the strategic level. The Army and the Naval General Staffs had to negotiate their differences in planning any major army-navy operation. In the IJN's case, the situation was even more complicated because the Combined Fleet led by Yamamoto exercised often much greater influence in operational planning than the Naval General Staff did. *In sequencing major operations in two widely separated parts of a theater, strategic leadership should make sure that adequate forces are available or becoming available for the accomplishment of each operational objective. Also, sufficient time should be given for redeployment, upkeep, and rest of forces taking part in the successive major operation. Otherwise, the risk of ultimate failure in one or both major operations will be considerably increased. Planning of major operations and campaigns should be vested in a single operational commander; competing planning responsibilities result in a compromise plan and often lead to the failure of the operation.*

In early 1942, the U.S. problem was how to check further Japanese advances in the southern and southwestern Pacific. Admiral King was the most vocal proponent of the view that the Allies should strengthen their defenses in the South Pacific and prevent any additional gains by the Japanese; otherwise, it would take much more time and sacrifice to roll back the Japanese conquests. The Allied strategy of fighting Germany first was fundamentally sound. However, General Marshall and other Army leaders were too rigid in pursuing their Germany-first strategy. They fought back King's efforts to deploy more troops, better equipped and trained, to the South Pacific. King's strategy was vindicated by the eventual Allied success in protecting the links between Australia and New Zealand and the United States. *In determining the main and secondary theaters of war, the strategic leadership should not go to extremes and assign almost all the best trained and equipped forces to the main theater; the principle of economy of effort requires that*

numerically sufficient and highly capable forces be assigned to the theater of secondary effort as well.

The weather played a prominent role in the both the Japanese and Allied carrier operations and greatly influenced the outcome of the engagement on the 8th. If the Allied carriers had been protected by low-hanging clouds and poor visibility as their Japanese counterparts were the Japanese aircraft might have not been successful; the opposite was equally true. *Planning and preparation for a major naval operation or campaign require thorough study of all aspects of the operating area. Despite all technological advances, the weather and climate considerably affect the employment of one's naval forces and aircraft. Operational commanders and planners should properly evaluate their potential impact on all phases of a major operation or campaign.*

The Port Moresby–Solomons operation was conducted over a major part of the Coral Sea and the adjacent Louisiade and the Solomons archipelagos, as well as the southeastern part of New Guinea, and the Bismarck Archipelago. Allied forces deployed from bases in New Caledonia, the New Hebrides, and eastern Australia. This part of the southwestern Pacific was militarily “undeveloped,” lacking naval and air bases and support facilities adequate for surface combatants, submarines, or aircraft. The Japanese controlled a number of well developed naval bases and airfields in the Bismarcks, in the Carolines, and on the southeastern coast of New Guinea. The Bismarcks and Solomons provided many natural harbors and anchorages that could serve as advance bases or havens for surface ships and as seaplane bases. The Allies were less fortunate, in that there were very few good bases and airfields in the South Pacific; those in eastern Australia were too far away. A major problem for both the Japanese and the Allies was the lack of any repair facilities for aircraft carriers. *Forces taking part in a major operation or campaign will have great difficulties in accomplishing their objectives without a well developed theater-wide infrastructure. Hence, whenever possible adequate numbers of naval bases and airfields and their supporting structures should be developed already in peacetime.*

Relatedly, Japanese naval forces and aircraft occupied central positions and so operated along relatively short, interior, and divergent lines. Their bases of operations flanked the sea routes from the U.S. West Coast and the Panama Canal to Australia and New Zealand. The Allied base of operations in the South Pacific was unfavorable for the employment of naval forces and aircraft. During the operation, the Allied carrier forces occupied a central position. In contrast, the Allied land-based aircraft deployed in eastern Australia and New Caledonia occupied an exterior position and operated along very long and converging lines of operation. *Naval warfare is invariably aimed to obtain/maintain or dispute control of certain ocean/seas. It cannot be conducted without access to bases/ports*

and airfields in the littorals. Positions and their locations still have considerable influence on the successful employment of one's naval forces. However, control of positions means little unless it is combined with the factor of force. The operational commanders and planners should not overestimate the importance and value of either central or exterior positions and resulting lines of operation or communications. They should try everything to maximize advantages and minimize disadvantages of a certain position for the employment of their combat forces. Yet what counts most is not the geography of the situation but the combat readiness, morale, and the skills of the operational commanders in employing their forces in combat.

Both the Japanese and the Allies had undeveloped command structures in the theater. The Japanese structure was highly fragmented. The parochialism of the two services, a major problem for the Japanese throughout the war in the Pacific, was particularly evident at the general-staff level. However, in the planning and execution of the Port Moresby–Solomons operation, the Japanese ensured unity of effort through unity of command. Admiral Inoue, as the Fourth Fleet commander, was responsible for command and control of all the navy and army forces. Yet he depended on the Combined Fleet for additional forces and had no influence on Yamamoto's decision to change the operation's timetable. *Operational commanders should have sufficient organic forces to ensure that assigned objectives can be accomplished; otherwise, it is difficult to exercise mission command. Optimally, they should also have full command and control over all subordinate forces during planning and the execution of a major operation or campaign.*

In contrast to the Japanese, the Allies established at least the rudiments of a theater or operational command organization. The Southwest Pacific Area and the Pacific Ocean Areas were, in modern terms, "theater-strategic commands." Most combat actions were conducted within SWPA, under MacArthur. Nimitz, as CINCPAC/CINCPac, had exclusive authority over the employment of Task Forces 17 and 11. As a result, a divided theater command existed both prior to and during the battle of the Coral Sea. This created numerous problems in providing comprehensive searches by land-based aircraft and intelligence sharing. Giving operational control over TFs 17 and 11 to MacArthur was effectively impossible; neither Nimitz nor King would allow the employment of carrier forces by an Army general; the carriers were the only major striking force left in the Pacific Fleet and could not be put at risk. Another problem was the lack of an intermediate commander for the South Pacific. Nimitz was nominally in command of SOPAC. However, he was some four thousand miles from the scene of action, and was unable to form an accurate and timely picture of the situation in the South Pacific. *Optimally, in planning and execution of a major operation or campaign, all subordinate forces should be*

controlled by a single commander. His headquarters should not be too far from the scene of action. This ensures the most effective control over operational intelligence, fires, logistics, and protection. The boundaries between the adjacent theaters should not be so rigid as to prevent friendly forces from crossing them as needed.

During the preliminaries, Nimitz employed carrier forces to great effect in reacting to Japanese advances in the Bismarcks and on the eastern coast of New Guinea. The Allied carrier raids in the southwest Pacific had much greater effect on Japanese planning for the pending Port Moresby–Solomons operation than was realized at the time. The carrier raid on Tokyo on 18 April 1942 had a great psychological effect, on the Japanese strategic leadership and people, and it also reinforced Yamamoto’s decision to go ahead with his planned Midway operation. However, the raid deprived the Allies of two large carriers to oppose the enemy advance into the South Pacific, although Admiral King had reliable information, from decoded enemy messages, about the planned attack on Port Moresby. Had the Tokyo raid not taken place, Nimitz would have had four carriers to oppose the Japanese thrust toward Port Moresby and probably would have inflicted much greater enemy losses. *The highest strategic leadership should give to subordinate theater commanders full command authority over all forces deployed within their areas of responsibility. Normally, the major striking forces should be employed in the theater of main effort. Hence, these forces should not be employed in a secondary theater, thereby making it difficult or even impossible to reinforce the theater of main effort as quickly as necessary. This is especially true if intelligence obtains timely and reliable knowledge of the enemy’s plans and intentions. Also, the time between two consecutive operations conducted in two separate maritime theaters of operations should allow for redeployment from one theater to another. This, in turn, requires sound balancing of the operational factors of space, time, and force versus an operational/strategic objective.*

The Japanese had inadequate knowledge of the situation in the theater. They knew nothing of the enemy’s plans or intentions, because of their inability to break Allied codes and the lack of human intelligence. Most of their information was obtained by scout aircraft and seaplanes based in the Bismarcks–New Guinea–Solomons. Their information on the physical features of the objective area and on ground defenses and air strength in the southwest Pacific was accurate, but Japanese knowledge of enemy carriers—their numbers, whereabouts, and movements—was a different matter. Apparently, the Japanese commanders and their staffs had too much faith in the reports of their pilots and submariners.

The Japanese seem to have based their decisions and plans on what they assessed as the enemy’s intentions and gave insufficient weight to the enemy’s capabilities. *Generally, and unless the commander possesses reliable and accurate*

knowledge of the enemy's plans, it is unwise to prepare estimates and make decisions based on enemy intentions instead of his capabilities. The enemy can use deception to hide his true intentions and actions.

Japanese planning for the Port Moresby–Solomons operation was deeply flawed. First, the plan was based on overly optimistic assumptions. The absence of accurate and reliable information on the whereabouts of the Allied carriers did not lead Inoue and his staff to assume the possibility of large enemy forces in the Coral Sea—to the contrary. The Japanese had a penchant for assigning multiple objectives to be accomplished simultaneously or nearly so; in this instance, the Japanese tried to accomplish all their objectives in a single major combat phase; they put too much emphasis on speed of action. They also added such minor tasks as ferrying Zeros to Rabaul, without taking into account the extra time they might take. *Operational commanders should not draft plans based on either overly optimistic or pessimistic assumptions. The lack of information on the whereabouts and the movements of the main enemy forces should counsel a great deal of caution in drafting operational plans. The factor of speed is critical for the successful employment of one's forces. However, a balance should be found between the need for speedy execution of the operation and avoidance of simultaneous or nearly simultaneous pursuit of multiple objectives. The mission given to a subordinate commander should not be changed by adding secondary tasks; the latter usually take more time than originally envisaged.*

The Japanese relied on the factor of surprise (and presumed enemy passivity), but here they did not prepare an operational deception plan to enhance the chances of achieving it. Instead, they unrealistically believed that secrecy alone would suffice. *Surprise, judiciously conceived and successfully employed, can be a most potent factor but should not be counted on. A plan for a major operation or campaign should include provision for operational deception to enhance the chance of surprising the enemy, but there must be means to ensure success even if surprise is not obtained. Secrecy alone is rarely sufficient to achieve surprise.*

The Japanese plan for the Port Moresby–Solomons operation was also overly complex. Its success depended heavily on precise synchronization of movements and actions of a large number of force elements—which made Inoue reluctant to change the plan until it was too late to have any effect. No provision was made for unforeseen events, such as the sudden appearance of the enemy and his reactions, mistakes made by the Japanese commanders, or bad weather. Finally, the Japanese task organization was too fragmented. The result was a considerable reduction in the combat potential of the force as a whole. The Japanese plans could work well only if everything went according to the plan and the enemy reacted as prescribed in the plans. *Too many intermediate objectives slow one's operational tempo and require commitment of larger forces and more time for*

the accomplishment of the ultimate objective. They also result in overly complicated plans. Task organizations should be simple, straightforward, and logical. The principle of unity of effort through unity of command should be applied. Division of a force into several smaller elements should generally be avoided.

The single greatest advantage the Allies had over the Japanese was accurate, reliable, and timely knowledge of enemy plans and intentions. The Allied commanders knew of the high-level Japanese debate about the Second Operational Stage of the war months and weeks before resulting plans were executed. King and Nimitz had great faith in the work of their cryptanalysts and so used this tremendous advantage to the fullest; otherwise, they would not have been able to employ their forces so successfully. By reading and properly analyzing enemy radio messages they were able to concentrate and prepare TF 17 and TF 11 in the Coral Sea in time to oppose the advance toward Port Moresby.

MacArthur and his staff, in contrast, apparently had little confidence in COMINT and instead depended on the relatively unreliable reports of land-based search aircraft based in northeastern Australia and at Port Moresby. Their information had only tactical value, limited by inadequate numbers of aircraft, long flying distances, and poor training of their crews for searches over seas and oceans. For their part, searches by TF 17 aircraft were limited by divided theater command. The absence of searches from the Solomons was one of the main reasons that the MO Carrier Force was not detected prior to entering the Coral Sea. Fletcher, who was never advised by SWPA of the gaps in the coverage by its aircraft, never had a full operational picture of the situation after the enemy forces were initially detected. *In planning a major operation or campaign, commanders and their staffs should focus on creating an operational picture of all aspects of the situation in a given theater of operations. Hence the need to convert information obtained from strategic and tactical intelligence into operational intelligence; otherwise, a critically important operational perspective on the situation will be missing. Operational commanders should not arbitrarily decide which sources of intelligence are more important; all sources of intelligence should be used in obtaining the picture of the operational situation and its trends.*

The Allied plans and preparations to counter the enemy thrust into Papua New Guinea started in late March 1942, when the first reliable information was obtained about the Japanese intentions in the southern and southwestern Pacific. The single major problem was how to concentrate sufficiently potent carrier force in the Coral Sea. The raid on Tokyo prevented Nimitz from concentrating four large carriers against two Japanese carriers. The U.S. Navy had only seven large carriers, and not all of them were available for action in the South Pacific. Another major problem was the shortage of oilers capable of underway replenishment. There was also an acute shortage of destroyers to be used as screen for the carrier

forces and for providing escort for the transports. Both Nimitz's Operation Order 23-42 and Fletcher's Operation Order 2-42 were classically simple and executable plans. Nonetheless, in contrast to the Japanese plan, they had the Allied carriers operating separately, not as a single group. This greatly weakened their strike packages in combat with the enemy carrier force. *Plans should be comprehensive but simple and logical. They should be also flexible enough to accommodate unforeseen events, due to either natural causes or the actions of commanders. The success of a major operation at sea is heavily dependent on the logistical support and sustainment. Operational commanders, not logisticians, are directly responsible for synchronizing the operations and logistics.*

The Japanese execution of the Port Moresby–Solomons operation matched the meticulousness but also the rigidity with which it had been planned. From the landing at Tulagi on 3 May until the end of the operation on 11 May, the opposing carrier forces made largely unsuccessful efforts to find each other, and mistaken identifications led to many minor and several major unsound decisions. Hara's decision to launch a late-afternoon strike against what he believed to be an enemy carrier force was a reckless gamble that cost a number of hard-to-replace experienced pilots. Similarly, Fletcher's decision to detach Crace's TG 17.3 could have ended in the destruction of Crace's unprotected group or greater losses for the carrier force because of the resulting weakening of its ship-based AA/ASW defense. Neither Hara's nor Fletcher's decision can be justified based on the information each had or did not have at the time.

Further, and although directed by Nimitz, Fletcher ran undue risks by waiting until 6 May to put his operation order into effect and finally combining TF 17 and TF 11 into an enlarged TF 17. Finally, Inoue was too slow in changing or modifying the plan in the face of unforeseen events, usually only after it was obvious that the original plan could not be carried out. He did not display "operational vision"—the ability to assess a situation properly, anticipate the flow of events accurately, and then react quickly and decisively when something unforeseen happens.

In the course of the execution of a major operation or campaign, operational commanders should keep a running estimate of the situation and make quick decisions. Their focus on the ultimate objective should be unwavering, but they should be willing to modify or even abandon intermediate ones. Sequencing and synchronization of movements should be flexible; otherwise, the plan is most likely to fail. Reports from commanders directly involved in carrying out a task should never be exclusively relied on; if they cannot be cross-checked against other sources of information they should be treated as assumptions. As Helmuth von Moltke the Elder observed and has been often repeated since, no plan survives the first contact with the enemy. The enemy has a will of his own and will react in ways that rarely can be

foreseen and might even appear irrational. Though operational commanders and their staffs should try to obtain the best knowledge and understanding possible of all aspects of the situation in a theater, there will be always gaps, in which they must make reasoned assumptions. High-stakes risks must sometimes be taken, but they should be calculated—an operational commander must find a proper balance between overcautiousness and recklessness. Finally, friction can be minimized but never mastered: chance, mistakes, and pure luck are inherent to warfare. The knowledge, judgment, and skills of commanders and their subordinates therefore remain, as they have in the past, the keys to success in war.

NOTES

1. *Japanese Army Operations in the South Pacific Area*, trans. Steven Bullard (Canberra: Australian War Memorial, 2007), p. 1.
2. Louis Morton, *Strategy and Command: The First Two Years*, U.S. Army in World War II: The War in the Pacific (Washington, D.C.: U.S. Army Center for Military History, 1962; updated 1989), p. 201.
3. Toshikaze Ohmae, "The Battle of Savo Island," in *The Japanese Navy in World War II: In the Words of Former Japanese Naval Officers*, ed. David C. Evans, 2nd ed. (Annapolis, Md.: Naval Institute Press, 1986), pp. 213–14.
4. Cited in Gary Brown and David Anderson, *Invasion 1942? Australia and the Japanese Threat*, Background Paper 6 (Canberra: Parliamentary Research Service, 29 April 1992), p. 5.
5. John B. Lundstrom, *The First South Pacific Campaign: Pacific Fleet Strategy December 1941–June 1942* (Annapolis, Md.: Naval Institute Press, 1976), p. 40.
6. Henry P. Frei, "Japan's Southward Advance and Its Threat to Australia in the Final Stage," cited in Mark Jacobsen, "US Grand Strategy and the Defence of Australia," in *The Battle of the Coral Sea 1942: Conference Proceedings, 7–10 May 1992* (Sydney: Australian National Maritime Museum, 1993), p. 48. Throughout, Japanese names are given in Western fashion, surnames last.
7. *Ibid.*, pp. 48–49.
8. Paul S. Dull, *A Battle History of the Imperial Japanese Navy (1941–1945)* (Annapolis, Md.: Naval Institute Press, 1978), p. 116.
9. Lundstrom, *First South Pacific Campaign*, p. 42.
10. *Ibid.*
11. Frei, "Japan's Southward Advance and Its Threat to Australia in the Final Stage," cited in Jacobsen, "US Grand Strategy and the Defence of Australia," p. 49.
12. *Ibid.*, p. 48.
13. Lundstrom, *First South Pacific Campaign*, p. 43.
14. Brown and Anderson, *Invasion 1942?*, p. 8.
15. "Battle of the Coral Sea: Overview and Preparations for Battle," *The Pacific War*, pp. 5–6, www.pacificwar.org.au/.
16. Brown and Anderson, *Invasion 1942?*, p. 9.
17. Lundstrom, *First South Pacific Campaign*, pp. 44–45.
18. *Ibid.*, p. 45.
19. Brown and Anderson, *Invasion 1942?*, annex reprinting "Battle of the Coral Sea," *Navy* (April–June 1992), p. 4.
20. Lundstrom, *First South Pacific Campaign*, p. 46.
21. Ohmae, "Battle of Savo Island," pp. 213–14; Frei, "Japan's Southward Advance and Its Threat to Australia in the Final Stage," cited in Jacobsen, "US Grand Strategy and the Defence of Australia," p. 49.

22. "The US Navy Refuses to Adopt a Defensive Posture in the Pacific," *The Pacific War*, p. 2, www.pacificwar.org.au/.
23. "Admiral C. W. Nimitz, USN Orders Task Force Two under Rear Admiral H. F. Leary, USN, to Proceed to the Australia New Zealand Area and Become Part of the 'Anzac' Force Operating Directly under the Commander in Chief, United States Fleet," p. 1, folder CINCPAC Operation Order 11-42, 31 January 1942, box 20, Records Relating to Naval Activities in World War II: Plans, Orders & Related Documents, CINCPAC January 1942 to April 1942, Record Group [hereafter RG] 38, Records of the Office of Naval Operations, National Archives and Records Administration, College Park, Md. [hereafter NARA].
24. Ibid.
25. Jacobsen, "US Grand Strategy and the Defence of Australia," p. 23.
26. "US Navy Refuses to Adopt a Defensive Posture in the Pacific," p. 3.
27. Lundstrom, *First South Pacific Campaign*, p. 92.
28. Ibid., p. 50.
29. Jacobsen, "US Grand Strategy and the Defence of Australia," p. 23.
30. Ibid., p. 49.
31. "US Navy Refuses to Adopt a Defensive Posture in the Pacific," p. 4.
32. Lundstrom, *First South Pacific Campaign*, p. 55.
33. Richard Bates et al., *The Battle of the Coral Sea: May 1 to May 11 Inclusive, 1942—Strategical and Tactical Analysis* (Newport, R.I.: Naval War College, 1947), pp. 3–4.
34. Ibid., p. 4.
35. *Japanese Army Operations in the South Pacific Area*, p. 12.
36. Bates et al., *Battle of the Coral Sea*, p. 20.
37. Ibid., p. 12.
38. *Japanese Army Operations in the South Pacific Area*, p. 42.
39. Morton, *Strategy and Command*, p. 199.
40. "Battle of the Coral Sea," p. 4.
41. *Reports of General MacArthur: The Campaigns of MacArthur in the Pacific* (Washington, D.C.: U.S. Government Printing Office, 1966), vol. 1, p. 46.
42. Cited in Morton, *Strategy and Command*, p. 199.
43. Ministry of Defence (Navy), *War with Japan*, vol. 2, *Defensive Phase* (London: Her Majesty's Stationery Office, 1995), p. 136.
44. Bates et al., *Battle of the Coral Sea*, p. 22.
45. Ibid., p. 3.
46. *Reports of General MacArthur*, p. 97.
47. John B. Lundstrom, *Black Shoe Carrier Admiral: Frank Jack Fletcher at Coral Sea, Midway, and Guadalcanal* (Annapolis, Md.: Naval Institute Press, 2006), p. 100.
48. Bates et al., *Battle of the Coral Sea*, p. 22.
49. It was reestablished on 20 October 1937 and became subordinate to the China Area Fleet. On 15 November 1939, the Fourth Fleet became a part of the China Expeditionary Fleet; it became subordinate to the Combined Fleet on 15 November 1940.
50. Bates et al., *Battle of the Coral Sea*, pp. 4–5. The South Seas Fleet is sometimes erroneously referred to as the "South Seas Force."
51. Ibid., p. 5.
52. *Japanese Army Operations in the South Pacific Area*, p. 52.
53. Ibid., pp. 47–48.
54. Bates et al., *Battle of the Coral Sea*, p. 18.
55. G. Hermon Gill, *Royal Australian Navy 1942–1945* (Canberra: Australian War Memorial, 1968), p. 32.
56. Bates et al., *Battle of the Coral Sea*, pp. 18–19.
57. Ibid., p. 19.
58. Headquarters U.S. Army, Japan, *18th Army Operations*, Japanese Monograph 37 (Washington, D.C.: Chief of Military History, U.S. Army Dept., n.d.), vol. 1, cited in Donald S. Detwiler, *War in Asia and the Pacific 1937–1949*, vol. 7, *The Southern Area, Part II* (New York: Garland, 1980) [hereafter Japanese Monograph 37], p. 3.
59. *Japanese Army Operations in the South Pacific Area*, p. 33. Some sources say the execution date was to have been 3 March.

60. Japanese Monograph 37, p. 3.
61. Morton, *Strategy and Command*, p. 215.
62. Frederick D. Parker, *A Priceless Advantage: U.S. Navy Communications Intelligence and the Battles of Coral Sea, Midway, and the Aleutians* (Fort Meade, Md.: Center for Cryptologic History, National Security Agency, 1993), p. 5, available at www.centuryinter.net/.
63. Morton, *Strategy and Command*, p. 215.
64. *Japanese Army Operations in the South Pacific Area*, p. 34; Japanese Monograph 37, p. 3.
65. Morton, *Strategy and Command*, p. 215; Japanese Monograph 37, p. 3.
66. *Japanese Army Operations in the South Pacific Area*, p. 45.
67. Parker, *Priceless Advantage*, p. 6.
68. *Japanese Army Operations in the South Pacific Area*, p. 41; Japanese Monograph 37, p. 4.
69. Lundstrom, *First South Pacific Campaign*, p. 398.
70. Morton, *Strategy and Command*, pp. 214–15.
71. Lundstrom, *First South Pacific Campaign*, p. 398.
72. *Japanese Army Operations in the South Pacific Area*, pp. 43, 54–55.
73. *Ibid.*, p. 48.
74. *Ibid.*
75. *Ibid.*, p. 55.
76. Bates et al., *Battle of the Coral Sea*, pp. 5–6.
77. *Japanese Army Operations in the South Pacific Area*, p. 61.
78. Samuel E. Morison, *History of United States Naval Operations in World War II*, vol. 4, *Coral Sea, Midway and Submarine Actions, May 1942–August 1942* (Boston: Little, Brown, 1984), pp. 10–11.
79. *Japanese Army Operations in the South Pacific Area*, p. 61.
80. Parker, *Priceless Advantage*, p. 7.
81. Morton, *Strategy and Command*, p. 216.
82. *Japanese Army Operations in the South Pacific Area*, p. 50.
83. *Ibid.*, p. 52. *Nachi*, also in CruDiv 5, was not assigned.
84. Lundstrom, *First South Pacific Campaign*, pp. 46–47.
85. *Japanese Army Operations in the South Pacific Area*, p. 51.
86. Lundstrom, *First South Pacific Campaign*, p. 47.
87. Lundstrom, *Black Shoe Carrier Admiral*, p. 122.
88. *Japanese Army Operations in the South Pacific Area*, p. 52.
89. *Ibid.*, p. 50.
90. *Ibid.*, p. 51.
91. *Ibid.*, p. 58.
92. *Ibid.*, p. 51.
93. *Ibid.*, p. 59.
94. *Ibid.*, p. 55.
95. *Ibid.*, p. 49.
96. *Ibid.*
97. *Ibid.*, pp. 49, 59.
98. Gill, *Royal Australian Navy 1942–1945*, pp. 40–41.
99. *Japanese Army Operations in the South Pacific Area*, p. 49.
100. *Ibid.*, p. 50.
101. Lundstrom, *First South Pacific Campaign*, pp. 72–73.
102. *Ibid.*, pp. 56, 59.
103. Morton, *Strategy and Command*, p. 217.
104. Bates et al., *Battle of the Coral Sea*, p. 15.
105. Lundstrom, *First South Pacific Campaign*, p. 73.
106. Ministry of Defence (Navy), *War with Japan*, p. 135.
107. Dull, *Battle History of the Imperial Japanese Navy*, p. 118.
108. H. P. Willmott, *The Barrier and the Javelin: Japanese and Allied Pacific Strategies February to June 1942* (Annapolis, Md.: Naval Institute Press, 1983), p. 209.
109. Morison, *Coral Sea, Midway and Submarine Actions*, p. 12.
110. *Japanese Army Operations in the South Pacific Area*, pp. 55–56.

111. Patrick H. Donovan, *Oil Logistics in the Pacific War: In and after Pearl Harbor* (Maxwell Air Force Base, Ala.: Air Command and Staff College, Air Univ., April 2001), p. 40.
112. Hiromi Tanaka, "A Japanese View: Coral Sea to Midway," in *Battle of the Coral Sea 1942*, p. 79.
113. *Ibid.*, p. 78.
114. Bates et al., *Battle of the Coral Sea*, p. 5.
115. Morison, *Coral Sea, Midway and Submarine Actions*, pp. 10–12.
116. Bates et al., *Battle of the Coral Sea*, pp. 13–14.
117. Cited in Tanaka, "Japanese View," p. 79.
118. Bates et al., *Battle of the Coral Sea*, p. 15.
119. *Ibid.*, p. 13.
120. *Japanese Army Operations in the South Pacific Area*, p. 57.
121. Bates et al., *Battle of the Coral Sea*, p. 14.
122. *Reports of General MacArthur*, p. 47.
123. Samuel E. Morison, *The Two-Ocean War: A Short History of the United States Navy in the Second World War* (Boston: Little, Brown, 1963), p. 142.
124. *Japanese Army Operations in the South Pacific Area*, p. 58.
125. Military History Section, Headquarters Army Forces Far East, *Submarine Operations in Second Phase Operations*, part 1, April–August 1942, Japanese Monograph 110 (Washington, D.C.: Office of the Chief of Military History, U.S. Army Dept., 1952) [hereafter Japanese Monograph 110], pp. 6–7.
126. Gill, *Royal Australian Navy 1942–1945*, p. 40.
127. Bates et al., *Battle of the Coral Sea*, p. 15.
128. *Japanese Army Operations in the South Pacific Area*, p. 57; Japanese Monograph 110, p. 10.
129. *Japanese Army Operations in the South Pacific Area*, p. 58.
130. Henry F. Schorreck, "Battle of Midway: 4–7 June 1942: The Role of COMINT in the Battle of Midway (SRH-230)," *The Navy Department Library*, p. 4, www.history.navy.mil/. BELCONNEN was the former CAST (COM 16) at the Navy Yard in Manila, transferred to Corregidor on 5 February 1942 and from there to Melbourne on 11 March 1942. It was initially subordinate to the ANZAC Area command and later to COMSWPA.
131. Lundstrom, *Black Shoe Carrier Admiral*, p. 119.
132. *Ibid.*
133. Parker, *Priceless Advantage*, p. 17.
134. *Ibid.*, p. 7.
135. *Ibid.*, p. 16.
136. *The Role of Communications Intelligence in the American-Japanese War*, vol. 1, August 1941–June 1942, September 1, 1942, Studies in Cryptology, 1917–1977, p. 211, SRH 012, box 01, RG 457, Records of the National Security Agency/Central Security Service, NARA.
137. *Ibid.*, pp. 211–12.
138. Rear Adm. Edwin T. Layton Papers, Series II, pp. 26–27, Unpublished Items, SRH 012, 036, 043, 081, and 125, Ms. Ac. 86.10, box 15, Naval Historical Collection, Naval War College, Newport, R.I. [hereafter Layton Papers].
139. Lundstrom, *Black Shoe Carrier Admiral*, p. 120.
140. Cited in *ibid.*, p. 122. American cryptanalysts apparently missed the fact that *Kaga* was not part of the force in the Indian Ocean. However, their British counterparts at Colombo quickly learned that two carriers were to operate in the southwestern Pacific. They decoded almost an entire message sent to Inoue on 13 April advising that CarDiv 5 (*Shōkaku*, *Zuikaku*), after detaching from the Striking Force near Singapore, would proceed to Truk on 28 April. The Admiralty passed this information to King, who in turn warned Nimitz and Leary on 15 April.
141. Gill, *Royal Australian Navy 1942–1945*, p. 41.
142. Parker, *Priceless Advantage*, p. 22.
143. CINCPAC Enemy Activities File April–May 1942, s.v. 25 April, Studies in Cryptology, 1917–1977, SRH 272, box 93, RG 457, NARA.
144. "Summary of Japanese Naval Activities on File in the White House Map Room, April 14, 1942" [hereafter "Summary of Japanese Naval Activities"], 26 April Supplement, United States Navy Records Relating to Cryptology, 1918–1950, SRNS 013, folder 001-0352, box 1, RG 457, NARA.
145. JICPOA-CINCPOA Intelligence Bulletins 16 March–1 June 1942, s.v. 27 April, folder

- 3222/23, box 107, RG 38, Records of the Office of the Chief of Naval Operations, NARA.
146. "Summary of Japanese Naval Activities," 28 April.
 147. Bates et al., *Battle of the Coral Sea*, pp. 24–25.
 148. Chris Coulthard-Clark, "RAN and RAAF Involvement in the Battle of the Coral Sea," in *Battle of the Coral Sea 1942*, p. 66.
 149. Bates et al., *Battle of the Coral Sea*, p. 20.
 150. *Ibid.*, pp. 25–26.
 151. Dull, *Battle History of the Imperial Japanese Navy*, p. 122.
 152. Bates et al., *Battle of the Coral Sea*, pp. 26–27, 122.
 153. Lundstrom, *First South Pacific Campaign*, pp. 92–95.
 154. *Ibid.*, p. 95.
 155. Bates et al., *Battle of the Coral Sea*, p. 23.
 156. Lundstrom, *First South Pacific Campaign*, pp. 94–95.
 157. *Ibid.*, p. 93.
 158. Lundstrom, *Black Shoe Carrier Admiral*, p. 122.
 159. *Ibid.*, p. 126.
 160. Lundstrom, *First South Pacific Campaign*, p. 92.
 161. *Reports of General MacArthur*, pp. 45–46.
 162. Lundstrom, *First South Pacific Campaign*, p. 100.
 163. Willmott, *Barrier and the Javelin*, p. 205.
 164. Bates et al., *Battle of the Coral Sea*, pp. 28–29.
 165. Lundstrom, *First South Pacific Campaign*, p. 100.
 166. See "Admiral C. W. Nimitz, USN Orders Forces under Vice Admiral H. F. Halsey, USN to Oppose the Advance of the Enemy in the New Guinea–Solomons Islands Area," p. 4, folder CINCPAC Operation Plan 23-42, 29 April 1942, box 20, Records Relating to Naval Activities in World War II: Plans, Orders & Related Documents, CINCPAC January 1942 to April 1942, RG 38, Records of the Office of Naval Operations, NARA.
 167. Lundstrom, *Black Shoe Carrier Admiral*, p. 137.
 168. Japanese Monograph 110, p. 10.
 169. Bates et al., *Battle of the Coral Sea*, p. 26.
 170. "The Battle of the Coral Sea, May 4–8, 1942," Action Report, Commander Task Force 17, 27 May 1942, p. 2, RG 38, Records of the Office of the Chief of Naval Operations, Records Relating to Naval Activity during World War II, WW II Action and Operational Reports, NARA.
 171. Layton Papers, p. 233.
 172. Bates et al., *Battle of the Coral Sea*, p. 15.
 173. Willmott, *Barrier and the Javelin*, p. 208.
 174. Lundstrom, *First South Pacific Campaign*, pp. 98–99.
 175. "Battle of the Coral Sea, May 4–8, 1942," p. 2.
 176. Cited in Willmott, *Barrier and the Javelin*, p. 207.
 177. Bates et al., *Battle of the Coral Sea*, pp. 12, 32.
 178. *Ibid.*, pp. 30–31.
 179. "Battle of the Coral Sea, May 4–8, 1942," p. 3.
 180. *Reports of General MacArthur*, p. 47.
 181. Willmott, *Barrier and the Javelin*, p. 208.
 182. Morison, *Coral Sea, Midway and Submarine Actions*, p. 25.
 183. Bates et al., *Battle of the Coral Sea*, p. 39.
 184. *Ibid.*, p. 38.
 185. Dull, *Battle History of the Imperial Japanese Navy*, p. 121.
 186. "Battle of the Coral Sea, May 4–8, 1942," p. 3.
 187. Willmott, *Barrier and the Javelin*, p. 220.
 188. Cited in Parker, *Priceless Advantage*, p. 27; "Summary of Japanese Naval Activities."
 189. Parker, *Priceless Advantage*, p. 28.
 190. Morison, *Two-Ocean War*, p. 143.
 191. Lundstrom, *First South Pacific Campaign*, p. 104.
 192. *Ibid.*, p. 100.
 193. "Battle of the Coral Sea, May 4–8, 1942," p. 4.
 194. Ministry of Defence (Navy), *War with Japan*, p. 138.
 195. Arno Sist, *Setting Sun: A Critical Analysis of Japan's Employment of Naval Airpower in the Battle of the Coral Sea* (Maxwell Air Force Base, Ala.: Air Command and Staff College, Air Univ., April 1998), p. 11.

196. Cited in Dull, *Battle History of the Imperial Japanese Navy*, p. 122.
197. Gill, *Royal Australian Navy 1942–1945*, p. 45.
198. Morison, *Coral Sea, Midway and Submarine Actions*, pp. 31–32.
199. *Japanese Army Operations in the South Pacific Area*, p. 62.
200. Gill, *Royal Australian Navy 1942–1945*, p. 46.
201. Dull, *Battle History of the Imperial Japanese Navy*, p. 124.
202. Morison, *Coral Sea, Midway and Submarine Actions*, p. 32.
203. “Battle of the Coral Sea, May 4–8, 1942,” p. 5.
204. Ibid.
205. Morison, *Two-Ocean War*, p. 144.
206. “Battle of the Coral Sea: The Events of 7 May 1942,” *The Pacific War*, p. 4, www.pacificwar.org.au/.
207. Ibid.
208. Gill, *Royal Australian Navy 1942–1945*, p. 49.
209. Lundstrom, *Black Shoe Carrier Admiral*, p. 161.
210. Willmott, *Barrier and the Javelin*, p. 233.
211. Morison, *Coral Sea, Midway and Submarine Actions*, p. 33.
212. *Japanese Army Operations in the South Pacific Area*, p. 63.
213. Ministry of Defence (Navy), *War with Japan*, p. 141.
214. Morison, *Coral Sea, Midway and Submarine Actions*, p. 40.
215. Ibid., p. 139.
216. “Battle of the Coral Sea: The Events of 7 May 1942,” p. 2. The time of the attack is also reported as 1115.
217. Gill, *Royal Australian Navy 1942–1945*, p. 47.
218. Morison, *Two-Ocean War*, p. 144.
219. Morison, *Coral Sea, Midway and Submarine Actions*, p. 56.
220. Ibid., p. 2.
221. Juergen Rohwer and Gerhard Hummelchen, *Chronology of the War at Sea 1939–1945: The Naval History of World War II*, 2nd ed. (Annapolis, Md.: Naval Institute Press, 1992), p. 138.
222. Bates et al., *Battle of the Coral Sea*, p. 87.
223. Morison, *Two-Ocean War*, p. 145.
224. Commander in Chief, Pacific Fleet, “Action Report Battle of the Coral Sea, 4–8 May 1942, 17 June 1942,” p. 5, available as CD 01573, MilSpecManuals.com.
225. Morison, *Coral Sea, Midway and Submarine Actions*, p. 57.
226. Morison, *Two-Ocean War*, p. 145.
227. Lundstrom, *First South Pacific Campaign*, p. 112.
228. Ibid., pp. 112–13.
229. Morison, *Coral Sea, Midway and Submarine Actions*, p. 61.
230. Ibid., p. 115.
231. Cited in *ibid.*
232. JICPOA-CINCPOA Intelligence Bulletins 16 March–1 June 1942.
233. Cited in Lundstrom, *First South Pacific Campaign*, p. 115.
234. Morison, *Coral Sea, Midway and Submarine Actions*, p. 62.
235. Ibid., p. 113.
236. Ibid., p. 63.

COMMENTARY

FOREIGN HUMANITARIAN ASSISTANCE AND DISASTER-RELIEF OPERATIONS LESSONS LEARNED AND BEST PRACTICES

Captain Cathal O'Connor, U.S. Navy

Foreign humanitarian assistance and disaster-relief (FHA/DR) operations are some of the most complicated operations conducted by the military. These missions constitute a core Navy mission; their planning and execution differ from those of a kinetic military campaign, but addressing the key principles early will enable the successful execution. The following lessons learned are based on my experiences over the past two years conducting five FHA/DR operations in the western Pacific.¹ Other situations may be different, but these suggestions may make the next operation more productive and rewarding.

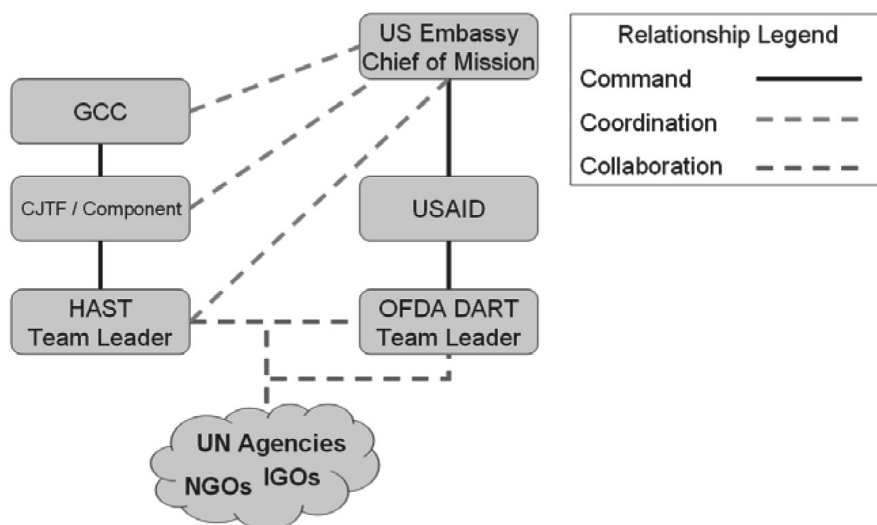
It is helpful to provide the crew and embarked staffs with an overview of current U.S. government FHA/DR guidance. The overarching principle is to remember one's place in an operation. The ambassador sets policy and directs the U.S. government team, while the U.S. Agency for International Development (USAID) and the Office of Foreign Disaster Assistance (OFDA) coordinate and manage the U.S. response. The Department of Defense (DoD) plays a supporting role.

In other words, the DoD is part of a comprehensive U.S. approach led by the Department of State (DOS). The DOS's lead for FHA/DR is USAID, which dele-

Captain O'Connor is the deputy commodore of Amphibious Squadron 11, forward deployed to Sasebo, Japan. On his previous tour he was Chief of Staff, Task Force 76. He also served as chief of staff during Operation TOMODACHI and later as director of the Maritime Response Cell at Joint Support Force Headquarters, Yokota Air Force Base, Japan.

gates FHA/DR to USAID/OFDA. The Office of Foreign Disaster Assistance may send an individual or a Disaster Assistance Response Team (DART) to coordinate the U.S. government response.

After DoD directs a geographic component commander (GCC) to provide support, either a component or a joint task force (JTF) will be tasked. Based on



Commander, Task Force 76's (CTF 76's) experience, a military Humanitarian Assistance Survey Team (HAST) must arrive quickly in order to link up with the American embassy staff and the DART, as depicted in the figure.²

Most of these relationships involve coordination and collaboration, so the first lesson to learn is the importance of exchanging liaison officers (LNOs) early to establish a trusting relationship, ensure clear communication, and enhance coordination.

Just as important as inviting the host nation and USAID/DOS personnel to provide liaison officers on the command ship is sending sailors to the disaster site. They will speak on the commander's behalf as to what capabilities the ships will bring when they get there, so choose wisely when forming a HAST. The team must embody the personality and skill to coordinate across the different departments and organizations, as well as interact with nongovernment organizations (NGOs).

The size of the HAST will depend on the size and scale of the damage. Once the HAST has assessed the situation and, in coordination with USAID, has identified where DoD can best support the relief efforts, a forward command element (FCE) may be needed to take over command, control, and liaison duties, to free up the HAST for work in the field along with USAID.

This essay focuses on natural disasters, where the U.S. Agency for International Development plays a major role in the military's operational planning and activities.³ As NGOs and international governmental organizations (IGOs) arrive in the disaster zone, they are organized via the United Nations "cluster" system, which designates an NGO as the lead of each functional group. HAST

members should attend cluster meetings with the USAID representatives and advise them about military support capabilities.

The second lesson—and the hardest to learn, as observed during every FHA/DR—is to do only what DoD can and then turn over to the host nation and NGOs as soon as possible. During FHA/DR operations, the host nation, NGOs, and IGOs generate thousands of requests for assistance. It is not the Department of Defense’s mission to fill them all. The Office of Foreign Disaster Assistance, along with the U.S. government country team, validates all requests for assistance and prioritizes and lists them in an electronic spreadsheet called the Mission Tasking Matrix (MITAM). HAST/FCE then reviews them for supportability and once more prioritizes them and tasks each entry to the appropriate force.

The third lesson flows from the second: Start with an idea of how the event will end and then determine an exit strategy and what milestones can serve as ceremonies. Think from the end.

Almost as relief begins to flow to those in need, the Department of Defense can begin planning its own departure. When the unique capabilities provided by the military are no longer in high demand or have been replaced by civilian capacity, when all affected areas are in the recovery stage, and when the host nation says so, it is time to go. The mission will not be complete, and there will still be suffering, but it is important to hold a ceremony to mark an end point for U.S. military assistance.

Given these three key lessons, the following reviews three operations in which CTF 76 was involved over the past two years. By examining small, medium, and large-scale FHA/DRs, one can see how these key lessons were followed. There are some additional take-aways as well.

TYPHOON MORAKOT: TAIWAN (SMALL-SCALE FHA/DR, LED BY CAPTAIN), AUGUST 2009

The USS *Essex* (LHD 2) Amphibious Ready Group (ARG) was returning from its second deployment of 2009 to off-load 31 Marine Expeditionary Unit (MEU) in Okinawa when Typhoon Morakot hit Taiwan 7–8 August with eighty-knot winds, a storm surge in excess of ten feet, and extensive flooding and landslides.

When Taiwan requested heavy-lift assistance from the U.S. government, the secretary of defense directed the U.S. Pacific Command (PACOM) to oversee military relief efforts. The Seventh Fleet assigned the task to CTF 76. Given the limited scope of Taiwan’s support request, Task Force 76 redeployed Commander, Amphibious Squadron 11 (CPR11), along with elements of the commodore’s staff, and 31 MEU aboard USS *Denver* (LPD 9), with four helicopters (two MH-53Es and two MH-60Ss) and an LCAC hovercraft. USS *Essex* and USS

Tortuga (LSD 46), the other two ships of the ARG, completed their off-load and returned to Sasebo.

Arriving off the coast of Taiwan, CPR 11's commodore assembled a HAST and flew ashore. He met with USAID, the American Institute in Taiwan, the Taiwan government, and military personnel to review the status of relief operations. After discussing the host nation's priorities with USAID representatives, the commodore decided he could best assist the Taiwan government by using the helicopters to lift construction vehicles and equipment to outlying areas. This would enable crews in isolated villages that were cut off from surface transport by flooding and landslides to perform search, rescue, and recovery operations.

The commodore deployed forty-five sailors and Marines to provide a tactical air control team, a helicopter rigging team, a helicopter logistics and maintenance team, and a public affairs team at Tainan Air Force Base, where they worked hand in hand with their Taiwanese counterparts. In light of the political sensitivities the commodore minimized his "footprint" ashore, flying the detachments in each morning and returning them to sea each night. Additionally, he directed his public affairs officer to ensure that the Taiwan military was the focus of media coverage.

The MH-60S provided aerial damage surveys and verification of helicopter landing zones. This freed the MH-53E to focus on lift missions. In six days the team flew fifty-five sorties, lifting twenty construction vehicles and twenty boxes of relief supplies, for a total of 255,800 pounds. As the demand signal waned, the commodore hosted a series of dignitaries ashore and marked a successful mission with the Taiwanese government, military, and relief personnel before redeploying to Sasebo.

So, to review: first and foremost, the commodore and his forces acted in support of the host nation and USAID. Second, the commodore put his liaison officers side by side with their Taiwanese counterparts and ensured that it was a Taiwanese face that was seen in the media—an important strategic message. Third, he used only the assets needed to meet the role that he and USAID identified. Finally, he held a ceremony to mark the host nation's decision that U.S. military support was no longer required, then left the scene.

ACT 2: EARTHQUAKE (INDONESIA: MEDIUM-SCALE FHA/DR, LED BY REAR ADMIRAL), SEPTEMBER–OCTOBER 2009

A month later, on 26 September, Typhoon Ketsana struck the Philippines with 140-knot winds and a half meter of rain on ground already saturated from three storms the previous month. Four days later, three earthquakes struck near Padang, Indonesia, on the western coast of the island of Sumatra. The Philippine

and Indonesian governments requested assistance from the U.S. government, and the secretary of defense directed PACOM to oversee military relief efforts.

Given the geographic separation, and in light of cultural sensitivities, the Seventh Fleet and III Marine Expeditionary Force (III MEF) agreed to split the ARG/MEU, with the 3rd Marine Expeditionary Brigade (3rd MEB) leading the Philippines FHA/DR mission and CTF 76 leading the Indonesian FHA/DR. CPR 11 and 31 MEU, already deployed to the Philippine coast for the bilateral exercise PHIBLEX, entered Subic Bay and reconfigured forces.

On 3 October, USS *Denver*, with a command element from CPR 11, elements of 31 MEU, and Tactical Air Control Squadron 12 (TACRON 12), sortied to Indonesia with three CH-53E helicopters and a helicopter rigging team. Leveraging the Taiwan FHA/DR lessons learned, Seventh Fleet sent USS *McCampbell* (DDG 85) and USNS *Richard E. Byrd* (T-AKE 4) with their helicopters to provide aerial surveys of the damage.

On 4 October, CTF 76 and a ten-member HAST/FCE flew to Padang. The FCE established a command post in Jakarta, met with the ambassador and his staff, coordinated with USAID and the TNI (Indonesian army), and participated in Department of State teleconferences at the embassy.

The HAST pushed forward to Padang and conducted surveys with USAID and personnel of the consul general's office. They also attended cluster meetings to educate NGOs on maritime capabilities, while USAID supported the NGOs in drafting MITAM requests.

In order to coordinate air operations and relief distribution, secondary command and control elements were formed at Tabing Military Air Base, Halim, and Padang airports, as well as in downtown Padang. An air-operations coordination cell was formed at Padang airport through an informal liaison with elements of the 353rd Special Operations Group, which was completing a bilateral exercise with the Indonesians. These sailors and airmen, with their TNI allies, opened the damaged airport for relief operations.

The HAST verified reports of damage to all four hospitals in Padang, and once typhoon conditions cleared in Guam, PACOM deployed the portable field hospital of the Air Force's Humanitarian Assistance Rapid Response Team (HARRT) via C-17s. The HARRT arrived 5 October and, through an informal liaison, fell under CTF 76 command and control.

By 7 October, the HARRT was treating patients, and by 9 October *Denver*, *McCampbell*, and *Richard E. Byrd* had begun supporting operations. The CPR 11 staff used *McCampbell's* and *Richard E. Byrd's* helicopters to assist USAID in conducting airborne surveys of roads, bridges, and potential landing zones in isolated areas, while the longer-range CH53E helicopters lifted food, water, and shelter supplies to isolated communities.

As operations unfolded, the FCE participated in Office of the Secretary of Defense public affairs roundtables and updated the status of operations via Twitter and Facebook. The staff in White Beach, Okinawa, supported the FCE and HAST by managing information collation for situation reports and video teleconferences and reporting requirements. This enabled the relatively small staff forward to remain focused on mission execution.

By 13 October, the demand for lift decreased as roads were cleared, and the HARRT was treating nonemergency patients. With concurrence from the Indonesian government, TNI, USAID, the U.S. embassy, and Seventh Fleet, a formal handover ceremony to USAID and the NGOs was held to coincide with the ambassador's visit to Padang. By 17 October all U.S. forces had departed. Within thirteen days the FHA/DR force had provided 150 sorties, lifted 640,000 pounds of supplies, and ferried 1,117 passengers, while providing medical treatment to 1,945 people. It accomplished this with only 165 personnel permanently ashore.

In retrospect, this was a more complicated FHA/DR than the first we looked at, with a requirement to provide an FCE to coordinate with the embassy in Jakarta and a HAST to work with the consul general and USAID in Padang. Also, the command and control of multiple service components was done informally. It worked because of the people involved, but a JTF would have provided clear-cut command-and-control relationships.

That said, the admiral and his staff were clearly acting in support of the embassy, the host nation, and USAID. Second, LNOs were placed at all the key areas—Jakarta, Padang, and the airfields and air bases used to distribute aid. Third, only USAID-approved MITAMs were executed, which kept the FCE out of the business of validating NGO requests. Finally, when the demand signal for helicopter lift and emergency room treatment reached a tipping point, the admiral hosted the ambassador and local dignitaries in Padang to celebrate the successful completion of the mission. All forces then departed.

SENDAI EARTHQUAKE AND TSUNAMI AND FUKUSHIMA DAIICHI NUCLEAR POWER PLANTS: JAPAN (LARGE-SCALE FHA/DR, LED BY ADMIRAL), MARCH–APRIL 2011

On 11 March 2011, a 9.0-magnitude earthquake off the northeast coast of Japan triggered a tsunami with waves that reached one hundred feet and traveled up to six miles inland. Over twenty-six thousand people were killed or reported missing, and the World Bank estimated damages in excess of \$120 billion.

PACOM designated U.S. Forces Japan (USFJ) as the commander of Operation TOMODACHI and assigned Seventh Fleet, Fifth Air Force, U.S. Army Forces Japan (USARJ), and Marine Forces Japan (MARFORJ) as supporting commanders. On 19 March elements of JTF-519, headquartered in Pearl Harbor,

augmented the staff of USFJ to form a joint support force (JSF). Rather than discuss how USFJ and JTF-519 conducted humanitarian assistance, disaster relief, consequence management, and the voluntary, assisted departure of dependents, I will focus on the role of the CTF 76 staff within the JSF.

On 12 March CTF 76 and fourteen staff deployed as Seventh Fleet's maritime response cell (MRC) to USFJ. The MRC was the representative of the joint force maritime component commander (JFMCC) and of the coordination cell within the headquarters. The MRC also received up to twelve additional officers from JFMCC subordinate commands as tasking peaked.

After establishing maritime surface and air watch teams in the Bilateral Joint Operations Command Center (BJOCC), CTF 76 inserted assistant chiefs of staff into USFJ directorates in order to augment their capabilities and assist in FHA/DR planning and execution. This gave the MRC ties within the USFJ staff, and later the JTF-519 led JSF to communicate successfully the JFMCC's priorities. The maritime response cell also participated in daily video teleconferences with the embassy staff, component commanders, and the Pacific Command, as well as boards, briefings, and meetings on behalf of the Joint Forces Maritime Command. This included the daily Joint Effects Coordination Board, where USAID, JSF, and component representatives reviewed validated MITAMs and then tasked them to the appropriate component.

Between 11 March and 7 April JFMCC pursued several lines of operation:

- Damage surveys by P-3C and helicopters
- Search and rescue (afloat and ashore) by ships and helicopters
- Lift support to the Japan Ground Self-Defense Force (JGSDF) from a dock landing ship (LSD)
- Relief supply delivery from carriers, amphibious assault ships (LHDs), destroyers, cruisers, and LSDs to shore by helicopters
- Airspace deconfliction and communications relay by E-2C
- Harbor mapping and obstacle clearance by divers from a salvage ship (T-ARS) and LSD
- Port-clearance operations by the U.S. Marine Corps from LHDs and LSDs
- Lift support to Japanese electrical utility workers from a utility landing craft.

In each line of operation, liaison officers were exchanged, and the close working relationships between the Japan Maritime Self-Defense Force (JMSDF) and the Forward Deployed Naval Forces made integration a rapid process. In one case, USN-JMSDF integrated relief operations were moving so fast that the

Japanese Self-Defense Force (JSDF), the JTFC, and the CJTF To-Hoku called for an operational pause in order to “re-baseline” the staffs and components.

By 7 April the main airport at Sendai had been reopened to civilian aircraft, the major ports had open channels, and isolated people had received aid. The Japanese defense minister visited USS *Ronald Reagan* (CVN 76) to thank the U.S. military for its support and requested CJTF To-Hoku, the JSF leadership, and component commanders to join him. Then the U.S. forces were released from FHA/DR tasking.

So even in a complicated FHA/DR operation, the basic rules did not change. The JSF followed the DOS lead, and LNOs were exchanged—in some cases making history, embarking JGSDF officers on U.S. Navy ships. In addition, JSF worked with USAID and JSDF counterparts to identify requirements from the Japanese government and then tasked them to the components. Finally, JSF supported the Japanese until they thought the work was done, and then JSF and the Japanese leadership held a ceremony, after which the U.S. FHA/DR forces departed.

Lessons Learned

To reiterate, the overarching concept and the three key lessons are:

- The ambassador sets policy and directs the U.S. government team. The U.S. Agency for International Development and the Office of Foreign Disaster Assistance coordinate and manage the U.S. government response. The Department of Defense supports.
- Exchange liaison officers to establish a trusting relationship, ensure clear communication, and enhance coordination.
- Do only what the Department of Defense can and then turn over to the host nation and NGOs, as soon as possible.
- Start with an idea of how the event will end; then determine an exit strategy and what milestones can serve as ceremonies.

Additional lessons from CTF 76's five FHA/DR operations of the past two years:

- If more than one component participates assign a joint task force and establish clear command-and-control relationships.
- Display all forces and internally displaced personnel on a “common operational picture.” Add lines of communication and government and military boundaries to show where additional coordination may be useful.
- Establish and maintain information management and knowledge-management rules to streamline data flow between components.

- Aggressively use social media and web pages, accessible to the public in multiple languages, to disseminate empirical data and combat fear and confusion.
- Use all sources to sense the environment. On a daily basis the commander must know what is needed. How are our actions impacting those most affected? Are we postured in the best way to assist the host nation?
- Work closely with the host nation to establish communication objectives, share information, and coordinate media events and interviews.

NOTES

1. Taiwan, Typhoon Morakot, 2009; Republic of the Philippines, Typhoon Ketsana, 2009; Indonesian earthquakes, 2009; Republic of the Philippines, Typhoon Megi, 2010; and the earthquake and tsunami in Japan, 2011.
2. U.S. Defense Dept., *Foreign Humanitarian Assistance*, Joint Publication 3-29 (Washington, D.C.: 17 March 2009).
3. U.S. Agency for International Development, *Field Operations Guide for Disaster Assessment and Response*, September 2005, available at www.usaid.gov/.

REVIEW ESSAY

THE TIP OF THE ICEBERG

Norman Friedman

Yoshihara, Toshi, and James R. Holmes. *Red Star over the Pacific: China's Rise and the Challenge to U.S. Maritime Strategy*. Annapolis, Md.: Naval Institute Press, 2010. 292pp. \$36.95

This is at once a timely and somewhat disappointing book. The authors quote numerous Chinese writers as arguing that sea power is essential to a rising China. They also argue, as Mahan did, that any country as dependent on sea-borne trade as China must also be interested in sea power. These ideas may have been controversial when the authors began writing, but the recent appearance of the refitted Chinese aircraft carrier formerly known as *Varyag* is an indication that should be obvious to all.

The technique of carefully sifting through a country's military and technical literature, as the authors and their colleagues at the China Maritime Studies Institute of the Naval War College do, can be valuable. The authors, for example, suggest that Chinese fascination with Mahan suggests a much deeper-rooted interest in developing sea power than may be imagined, and that in turn suggests

that the Chinese government is likely to keep investing in it. But this approach has its limitations. What is published is in effect the tip of an iceberg. Part of that iceberg is classified technical and tactical literature; part is technical information that is not classified but may not be discussed in the open literature. Part is also the political and bureaucratic environment within China, which for many reasons may never be discussed frankly in public. A full evaluation of the prospects for

Norman Friedman is a widely published naval strategist and historian, specializing in the intersection of national policy and technology. He has long been a consultant to the U.S. Navy and to several of its major contractors. Dr. Friedman received his PhD in theoretical physics from Columbia University. He is also the recipient of the annual prize in military history from the Royal United Services Institute for his book Fifty-Year War: A History of the Cold War.

the People's Liberation Army Navy (PLAN) ought to include all of these factors. Since this is an unclassified study, at the least it should have taken into account much more completely Chinese internal politics as well as pertinent material from non-Chinese sources.

Much of this book is devoted to an account of the rise of modern Chinese naval weaponry, the most spectacular being the “carrier killing” DF-21 ballistic missile, and the tactics associated with it. The tactical discussion makes much of Mao's doctrines developed for guerrilla warfare. It is surprising that the authors spend no time at all looking at the style of warfare developed by the Soviets during the Cold War. The PLAN began under Soviet tutelage, and much of its technology is of Russian origin. It is difficult, for example, not to see Cold War Soviet concepts in Chinese descriptions of a fleet operating under the umbrella of shore-based weaponry. The current Chinese Su-30 force armed with Russian-developed AS-17 missiles is not too different in principle from the Cold War–vintage Soviet Backfires using AS-4s.

The main lesson of Cold War tactical development was that ocean surveillance was crucial. If it worked, then a moving force at sea could be targeted; if not, the force was free to operate as it wished. Ocean surveillance makes no appearance whatever in this book, perhaps because it is not discussed in open Chinese literature. One might also suspect that open-literature Chinese calculations, e.g., of how many Su-30s it takes to kill an Aegis cruiser, do not reflect any detailed classified work, but rather are intended to inspire the reader. The authors may be quite right that open writing about strategy often reflects reality, but that is much less the case with tactics. For example, during much of the Cold War U.S. open-ocean antisubmarine warfare relied heavily on the Sound Surveillance System (SOSUS). For decades it was hardly mentioned in the open literature.

Other slips leave the reader uncomfortable. We are told that the Chinese may be able to operate carriers under the umbrella of the new antiship missile, as though it takes a carrier to sink another carrier. U.S. submariners may find that difficult to believe; the South China Sea is usually described as a paradise for them. This ability, incidentally, is said to allow the Chinese not to build full-up supercarriers—as though the size of the carrier is dictated by its need to beat off opposition, rather than by its potential striking power. Aegis ballistic-missile defense is evaluated mainly as a possible limitation on Chinese intercontinental ballistic missile effectiveness, but it is probably much more important as a counter to the antiship ballistic missile, a point not at all clear from this book. These are only examples.

The authors set up (and destroy) a straw man, that many in the United States may imagine that the new Chinese navy is being built up specifically to overrun Taiwan, and that somehow it will vanish as soon as that is achieved. Who is that

naive? When the Chinese first bought *Varyag*, the rumor was not that it would help them conquer Taiwan, but that it was essential for dominance of the South China Sea (which made a lot more sense). The Chinese navalists certainly explain how valuable Taiwan could be in their hands, but a cynic would have to wonder to what extent they are playing to their government's internal propaganda, with its emphasis on Taiwan.

It would have been interesting to have had some quantitative comparison of Chinese investment in the different services, because that might have indicated how far Chinese naval expansion is likely to go; at some point any expansion or modernization program hits financial limits, and heavy investment in the other services would limit purely naval investment. The Chinese are currently modernizing across the board. The authors dismiss future growth in army investment on the ground that there are no current border problems. However, a Chinese central government nervous about stability has to see its army as the force that guarantees its survival. It is worth spending a great deal on more or less useless toys to keep that army loyal and happy. The army is also the backup if an enemy does make it ashore, and it is the force needed to conquer Taiwan—if the Chinese government ever decides to take that chance. It is also the force that faces Russia in Siberia.

In this reviewer's opinion, the authors have produced a wake-up book that alerts readers to the reality and the likely enduring character of Chinese naval expansion. That certainly matters. Beyond that they seem to falter. Besides the gaps implied above, there is no discussion of the Chinese industrial base (e.g., the extent of dependence on foreign technology and the potential for overcoming it).

Yoshihara and Holmes read the Chinese literature; this reviewer does not. But the main conclusion from that reading—that the Chinese have decided to build an oceanic navy—now seems so obvious that it is not really worth arguing. To go further, it is necessary to read other languages, not well reflected in this book, such as those of naval hardware and of naval tactics.

FAIR WARNING

Martin Murphy

Kraska, James. *Maritime Power and the Law of the Sea*. New York: Oxford Univ. Press, 2011. 464pp. \$95

"In the unrelenting struggle of peoples," the historian Pete Padfield wrote, "those ascendant at sea have, at least in the modern era, proved consistently successful either singly or in alliance against those with a territorial power base." This notion, which he took from the renowned strategist Colin S. Gray, drove his 1999 history *Maritime Supremacy and the Opening of the Western Mind*. Naval War College law professor James Kraska has written a book that could well have been entitled "Maritime Myopia and the Closing of the American Mind," for that is the story it recounts and the future it foretells unless the United States responds to the tocsin he sounds.

To be effective, naval power requires access to the littorals in times of peace as well as war. Their importance is not in doubt; they contain 70 percent of the world's human population and most recoverable living and nonliving resources. Coastal states without wider maritime interests of their own naturally want to limit access by foreign navies, which for the most part means the U.S. Navy and Marine Corps. It is, therefore, worrisome but not surprising that the promotion of navigational freedom increasingly is being referred to in international academic and policy circles as the "American" problem.

The fundamental debate in oceans policy is the extent and degree to which coastal states can extend their jurisdictions seaward. The key battleground is the exclusive economic zone (EEZ), which altogether accounts for just under 40 percent of the world's ocean space. This concept was created *sui generis* during the United Nations Convention on the Law of the Sea (UNCLOS) negotiations, as a compromise between the conflicting demands of coastal and maritime

states. Coastal states were allowed to control the economic resources found in and under the sea out to a limit of two hundred nautical miles but had no right to impede free movement on and through the water column.

Kraska demonstrates that this compromise is under sustained attack. He argues that the liberal order of the oceans based on the concepts of state sovereignty,

Martin Murphy is a senior fellow at the Atlantic Council in Washington, D.C., who is an internationally recognized expert on piracy and irregular conflict at sea. Between 2008 and 2010, he was a senior fellow at the Center for Strategic and Budgetary Assessments. Dr. Murphy's most recent work is Somalia, the New Barbary? Piracy and Islam in the Horn of Africa, published 2011.

national self-determination, and legal equality is being replaced by socialist and dependency-theory models. These push a moral agenda of “fairness,” which is alien to previous functional conceptions of international law that seek to maximize order. Like any form of politically inspired collective action, “fairness at sea” can only be attained through the imposition of greater state control.

In response, Kraska repeats the cardinal question that Ambassador John Negroponte asked twenty years ago: “Who will protect freedom of the seas?” Kraska’s answer is that although many states are interested in that freedom, to the point that some (including Russia, Singapore, and the United Kingdom) will protest attempts to undermine it, none but the United States have the widespread interests or resources worldwide to back up their objections with action.

Taking action requires institutional understanding and political will. Within the U.S. government, institutional understanding of the importance of navigational freedom is limited increasingly to the Department of Defense and, to a degree, the U.S. Coast Guard. While it was encouraging to hear Secretary of State Hillary Clinton announce during her visit to Hanoi in July 2010 that the “United States has a national interest in freedom of navigation, open access to Asia’s maritime commons and respect for international law,” the reiteration of this long-standing commitment comes somewhat out of the blue. For the most part the Department of Defense appears to have lost the support of the State and Commerce Departments, which have been overwhelmed by pressure from the assiduous efforts of such agencies as the Environmental Protection Agency and National Oceanic and Atmospheric Administration to put environmental protection at the pinnacle of U.S. oceans policy. This means that navigational freedom has lost its preeminence when at the same time the need to build relations with newly assertive (and powerful) coastal states has meant that acquiescence to excessive coastal claims is being offered in exchange for concessions in other policy areas.

Kraska argues strongly that this creeping oceanic enclosure is a genuine risk to international security. His judgment is valuable not only because of his scholarship but because of his practical experience as a Navy judge advocate specializing in the negotiation of oceans law matters. By privileging sea mammals over seamen, parts of the U.S. government, and an international network of like-minded bureaucrats in other states and international organizations that share their belief, are just as active in eroding the U.S. Navy’s freedom of maneuver and undermining U.S. national security interests as are China, Burma, Indonesia, and the European Union.

It would be foolish to argue that all those who promote greater state control over the oceans are motivated solely by a desire to keep the U.S. Navy from approaching their coasts. Some, as Kraska points out, are motivated by simple nationalism—to keep what they view as their national patrimonies free from

foreigners. Those at the other end of the spectrum take the view that protecting the common heritage of mankind is a cause more noble than grubby national interest. Some coastal states, however, are using increasingly aggressive legal means—dubbed “lawfare”—to increase control over their EEZs by

- Delegitimization of the use of force and prevention of access by warships
- Sovereignty claims
- Environmental protection.

Kraska highlights the interrelation among all three by pointing out that China has moved from security to resource-related and environmentally based arguments in its campaign to exclude U.S. Navy warships and aircraft from its EEZ. This shift is reflected on the water by its newfound preference for confrontation using coast guard cutters, oceanographic ships, fisheries protection vessels, and even “independent” fishing boats rather than warships.

None of these claims are justified under UNCLOS, whose text is unambiguous; references to it in the authoritative commentary offer no comfort to those who wish to change unilaterally what was agreed. The only course of action for the Chinese is to assert their authority and defy other states, hoping that in time their measures will become accepted. Just as World War II Germany gambled that no one would contest its reoccupation of the Rhineland, so too are these states being proved right as they territorialize what had previously been international waters. Observe China’s recent tactics in the South China Sea. For some in China, such as one commentator writing in the *People’s Daily* in December 2010, willful misreading of the treaty has become commonplace: “The United States has not signed the U.N. Convention on Law of the Sea because it considers exclusive economic zones to be international waters, which, by its hegemonic logic, should be included in the U.S. sphere of influence.” China’s stance might be the most egregious on the issue of excessive EEZ claims, but where it leads, others will follow. As Kraska comments, a “combination of boldness and power make Beijing the world’s greatest hazard to freedom of navigation in the EEZ.”

This work has its weaknesses: the author’s review of strategic issues lacks precision, and his summary of relevant maritime history is a Cook’s tour of events that naval readers would regard as basic. Yet Kraska’s knowledge of events may be sorely needed by readers unfamiliar with the strategic history and context of the law of the sea, and indeed the history bears repeating for those who no longer view the sea as Mahan’s highway. In any case, these reservations are small compared to the author’s thorough understanding of the subject’s legal core and his clear and forthright exposition of the issues.

It is no exaggeration to say that this is an important book. The warning it conveys may have been sounded before, but never so clearly or so comprehensively. It is a warning worth repeating again and again until U.S. government policy regains the full-blooded recognition that freedom of navigation is vital for the sustenance of many of the other freedoms that we take for granted. Anyone concerned with freedom of navigation, and indeed freedom itself, should read this book. Those who are in a position to act on its recommendations need to do so without delay.

BOOK REVIEWS

A GATHERING OF DIFFERENT IDEAS

Rabi, Uzi, ed. *International Intervention in Local Conflicts: Crisis Management and Conflict Resolution since the Cold War*. New York: Tauris Academic Studies, 2010. 326pp. \$99

This edited volume presents an insightful collection of case studies assessing international interventions in the post-Cold War era, with a strong emphasis on the Middle East. The essays offer a broad exploration of international conflict management and resolution, taking a hard look at failure and success. Unlike many other books, this one brings together scholars from different countries, presenting an often unique and most importantly different viewpoint on conflicts of U.S. interest. It is impractical to review each chapter, but the following five are particularly compelling for U.S. readership. The attempts of the European Union (EU) to mediate the Balkan and ongoing Israel-Palestine conflicts present a detailed account of EU conflict management in the larger context of the difficulties brought about by institutional challenges and the complex structure of EU policies. A French perspective on Middle Eastern politics is elucidated by Jean-Pierre Filiu. The value of French diplomatic efforts to conflict resolution is highlighted, with the example of the direct contact with Syria and Iran during Operation

GRAPES OF WRATH in 2006. Comparing France to the United States, the author points out different narratives, citing such examples as Beirut 1982. The next chapter delves into the important topic of clashes between the Islamic denominations, Sunni and Shia. The feeling of alienation between these groups dates back to the earliest days of Islam. U.S. interventions in Iraq and Afghanistan are discussed as a starting point for increased Iranian support for Shias throughout the Middle East and to confute the common argument that Shias are more sympathetic to Iran than to their home countries. No conclusion is offered about “whether sectarianism is the cause or symptom of the recent geopolitical changes in the region,” but the authors do provide informative insight and point to the importance of understanding these dynamics for any conflict resolution in the region. Chapter 12 explores the motives of the involvement of regional actors in the Israel-Palestine conflict. Egypt and Saudi Arabia both have interests in being perceived as the indispensable Arab mediator. Ultimately, Egypt has a larger

stake, because of its proximity and domestic politics considerations, and it has stayed committed throughout, while Saudi Arabia has less of an incentive to guarantee that efforts become reality.

The concluding chapter stimulates the reader to think about the term “international community.” Rajan Menon offers a sharp yet pessimistic evaluation of the international community’s efforts to react to grave human rights violations and its “inability to act, particularly when it encounters opposition from its most powerful states.” While he displays minimal confidence in governments, the author remains optimistic that one day people will change and cure the “weakness of we-ness,” thereby initiating real institutional change. A common ground for all essays is the critical analysis of international efforts to resolve conflicts. Every author strives to answer important questions regarding the motivations of external actors to become involved. Overall, this volume presents a valuable contribution and is essential reading for anyone looking to understand the struggles of international conflict management.

LARISSA FORSTER
Naval War College



Fisher, David, and Brian Wicker, eds. *Just War on Terror? A Christian and Muslim Response*. Burlington, Vt.: Ashgate, 2010. 231pp. \$29.95

This edited volume provides fourteen essays on various aspects of combating terrorism and insurgencies from a just-war perspective. All the contributors, with the exception of Philip Bobbitt, an American, are from the United

Kingdom. Contributors are prominent members of their respective faculties and are well-known within the fields of war and security studies. While the subtitle accentuates religious traditions with respect to the just-war tradition, the volume is not a dialogue between religious perspectives, nor is every chapter devoted to religious interpretations. Rather, the book is a collection of essays, of which two are authored by practicing Muslim scholars. Apart from these essays, the religious dimensions of combating terrorism are not prominently presented.

The two essays by Islamic scholars are especially helpful for readers interested in the religious dynamics of post-9/11 terrorism. In the first, “Terrorism and Islamic Theologies of Religiously-Sanctioned War,” Tim Winter, who lectures in Islamic studies at the University of Cambridge and is an imam at the Cambridge Mosque, recounts the interaction of Islamic jurisprudence with the emerging international system of the nineteenth century, as scholars and leaders in Muslim countries have sought to integrate various religious interpretations with international political realities. He also provides a useful overview of the concepts of *jihad* and *hiraba*. The second significant essay is that of Ahmad Achtar, “Challenging Al-Qa’ida’s Justification of Terror.” Achtar is a lecturer in Islamic studies at Heythrop College, University of London, and he argues, with documentation, that al-Qa’ida’s justifications of terror are not part of mainstream Sunni religious and legal thought and are not shared by the majority of Muslims.

Other essays focus more on aspects of the conflicts in Iraq and Afghanistan and on tenets of the just-war tradition.

Of these, three essays in particular stand out as of interest to readers of this journal: Sir Michael Howard's "Philip Bobbitt's Terror and Consent: A Brief Critique," Brian Wicker's "Just War and State Sovereignty," and David Fisher's "Terror and Pre-emption: Can Military Pre-emption Ever Be Just?"

In the final chapter, the editors offer a reflection on countering terrorism justly after 9/11. In these few pages they provide an excellent summary of the weaknesses of al-Qa'ida and the likelihood of its eventual demise. They also remind readers of the necessity of maintaining ethical standards in the midst of conflict: "A common thread running through all the lessons learnt has thus been a rediscovery of the importance of morality even amidst and, indeed, particularly amidst the pressures and passions of conflict."

As with most edited volumes, not every chapter will appeal to everyone. However, for anyone interested in contemporary just-war thought, its viability, and its relevance to twenty-first-century warfare, there is much in this volume on which to reflect.

TIMOTHY J. DEMY
Naval War College



Cheney, Dick, with Liz Cheney. *In My Time: A Personal and Political Memoir*. New York: Threshold Editions, 2011. 565pp. \$35

As political memoirs go, Dick Cheney's *In My Time* is arguably one of the more candid, in a genre that tends to fall into two categories—the remarkably bland and the overly fulsome. Cheney avoids both these pitfalls in a book that will

not change the mind of a single Cheney hater or his small legion of admirers.

Cheney was at the center of American politics for almost forty years, and long before he became the Darth Vader of American politics he had a reputation for being one of the ablest and most reform-minded members of the Republican Party. He had an "A-list" résumé, including stints as the youngest chief of staff in the history of the White House; as the nation's seventeenth secretary of defense, presiding over Operation DESERT STORM; and as a key member of the GOP's leadership in the House of Representatives. So it was no surprise when Texas governor George W. Bush asked Cheney to lead his vice-presidential search committee in the spring of 2000. It was a surprise, however, when Bush selected his search committee chair to be his running mate, for Cheney brought few political benefits to the Republican ticket. Yet as *In My Time* makes clear, Cheney's Washington experience and national-security credentials were seen as an asset to Governor Bush. "You know, Dick, you're the solution to my problem" was the way Bush broached the subject to him.

In short order, Cheney became the point man for all that was seen as wanting in the Bush administration and, in the view of some, for all that was criminal. For the tiny cadre of moderate Republicans who urged the administration to move "to the center" and trim "our sails" in the wake of the divisive election of 2000, Cheney made it clear that the administration would not alter its conservative agenda. He infuriated congressional Democrats by refusing to release the lists of "everyone we met with" when he chaired the administration's energy policy task force, and after the

attacks of 9/11, when he observed that the nation would have to work “the dark side, if you will,” Cheney was seen by many as a champion of un-American practices, including water boarding and warrantless wiretapping. Cheney vigorously defends both programs, arguing that the wiretapping “saved lives and prevented attacks. If I had it to do all over again, I would, in a heartbeat.” The administration’s “liberation” of Iraq, which, in concert with the aftermath of Hurricane Katrina, dramatically eroded public support for President Bush, is also vigorously defended, although Cheney concedes that “we could have done things better” in terms of dealing with Katrina.

Cheney and his loyal lieutenants, I. Lewis “Scooter” Libby and David Addington, saw themselves as restoring the American presidency to the status it had held prior to Vietnam and Watergate. Some refer to this bygone era as one dominated by an “imperial presidency,” but for Cheney it was the natural, constitutional, order of things. Presidential precedents were on their side but the quiet constitutional revolution that occurred while Cheney served as Gerald Ford’s chief of staff—a revolution that produced an adversarial media with no qualms about releasing the nation’s most closely held secrets; a judiciary willing to overrule executive and legislative war powers, while sometimes invoking elements of international law; and a Congress eager to challenge presidents on sensitive national-security issues, including intelligence matters—triumphed in the end. Bush and Cheney left office as discredited figures, and while both remain optimistic that history will vindicate them, this book makes a strong case that some of the

administration’s actions deserve a sober second look. However, far too much seems to be at stake for that to occur.

STEPHEN F. KNOTT
Naval War College



Boyne, Walter J. *How the Helicopter Changed Modern Warfare*. Gretna, La.: Pelican, 2011. 352pp. \$29.95

“In either case, the helicopter has significantly changed the face of modern warfare. It has done so despite restrictions placed on its performance by its inherent design features. And perhaps more than anything else, it has done so because of the brave, talented aircrews who flew the helicopter in the most intensely dangerous conditions of warfare that have ever been seen.”

So concludes the final chapter of a new and timely book by noted aviation writer and retired U.S. Air Force colonel Walter Boyne. This volume revolves around two theses. The first is stated in the title: helicopters, since their introduction, have produced dramatic changes in the conduct of warfare. The second thesis suggests that helicopters themselves have failed to keep pace with the very changes caused by their introduction. The conclusions drawn from this corollary idea are likely to prove controversial.

Boyne’s prose combines accuracy with regard to technological issues with a clarity that renders these complex ideas accessible, even to readers unfamiliar with the intricacies of rotorcraft aeronautics. The scientific and engineering challenges are interwoven with the stories of such industry pioneers as Igor

Sikorsky, Frank Piasecki, and Arthur Young. The narrative offers a tip of the hat to the Marine Corps, acknowledging that institution's decision to champion this emerging technology, as well as the parts played by the Navy and Coast Guard, but the strength of this book resides in its examination of the helicopter's influence on combat over land.

The Vietnam War serves as the lens through which the rapid development of helicopter-borne operations is studied. Anecdotes about operational leaders whose vision married capabilities provided by industry with the arduous conditions of the Southeast Asian battlefield provide evidence of how modern warfare was changed. Anecdotal evidence is supported by statistics detailing the number of troops and the amount of material transported within the theater, as well as the grim losses suffered in accomplishing these missions. Within the Vietnam context, the tactical and operational impacts of rotary-wing aircraft are clearly demonstrated. The argument revolves around the postwar failure to maintain the wartime momentum.

The discussion of the post-Vietnam developments asks difficult and uncomfortable questions. Delving into the fiscal disparity between the research and development efforts supporting fixed-wing, tactical aircraft and similar efforts for the benefit of rotary-wing aviation, the author reaches conclusions that may be disconcerting for advocates of traditional airpower. This critique of overspending on fixed-wing research and development at the expense of survivability, lethality, and capability for rotary-wing aircraft gives the book a controversial edge.

Walter Boyne has delivered a timely study that asks difficult, important questions about the future of military aviation, especially in an era when the nature of combat operations is rapidly evolving. For these questions alone, it is a worthwhile read. The lucid analysis of the technological issues and the compelling stories of the pioneers and warriors who brought the helicopter to prominence are icing on the cake.

K. J. DELAMER
Naval War College



Tully, Anthony P. *Battle of Surigao Strait*. Bloomington: Indiana Univ. Press, 2009. 329pp. \$18.45

The sprawling battle of Leyte Gulf was fought from 23 to 26 October 1944, and nearly seventy years later it still has the power both to fire the imagination and to provide enduring military lessons. As drama goes, the battle (or more precisely, a series of engagements, each deserving a name of its own) is an apparently bottomless cornucopia of personalities, desperate gambles, and heroism, as well as of enough "what-ifs" to spawn a cottage industry of alternate histories. In at least one way, Leyte Gulf has similarities to Gettysburg. Both battles have been written about so extensively that some authors focus on the smaller engagements that together complete the picture of the larger conflict.

The basic story of Leyte is a familiar one. Faced with growing U.S. naval power, a steadily weakening fleet, and initial American landings in the Philippines, Japanese naval authorities initiated a bold stroke. Using their precious remaining carriers as bait, they drew off Admiral William F. Halsey's Third Fleet

while they attempted to reach the U.S. beachhead with powerful surface forces approaching through the San Bernardino and Surigao Straits. The majority of power would be contained in Admiral Takeo Kurita's Central Force, which would force the San Bernardino Strait and approach the U.S. transports from the east. Two smaller but still potentially deadly forces, commanded by Admirals Shoji Nishimura and Kiyohide Shima, would attempt the Surigao Strait and attack the Americans from the south. Kurita's force came closer to victory, but, due in part to a gallant defense by inferior U.S. forces, and with the counsel of his own forces, Kurita turned back on the doorstep of success. In contrast, Nishimura never had a chance. Admiral Jesse B. Oldendorf turned the Surigao Strait into a killing sack. As Nishimura drove deeper into the strait, his forces were treated to wave after wave of attacks that ended in a crescendo of firepower, as Oldendorf's main battle line put an end to the Japanese southern attack.

Rather than write only about the big picture, Tully puts Surigao Strait under a microscope. Drawing extensively from little (or never) -accessed Japanese records, he painstakingly pulls together his account of the battle. Each Japanese ship is discussed in detail, each commanding officer is subjected to scrutiny, and communications are reviewed. The result is impressive: what emerges is a convincing and incredibly detailed account of this segment of the battle.

In re-creating the battle, Tully takes on several "mysteries" that have endured since 1944. The first is the fate of the Japanese battleship *Fuso*. It is known that the ship was destroyed, but the exact circumstances of its sinking have

been a matter of conjecture. The next mystery is the sinking of the Japanese destroyer *Michishiro*. In this instance there is uncertainty regarding the claim that USS *Hutchins* (DD 476) sank it. Finally, Tully seeks to discover the exact manner in which the Japanese destroyer *Yamashiro* was sunk. By Tully's own admission, these issues are military minutiae, but they are important to him. He obviously wants to know where U.S. torpedoes struck the doomed *Yamashiro* and what happened to *Fuso*.

Tully's writing style, for the most part, is pleasant, analytical, and temperate, although from time to time the neutral tone of the distant observer shifts to a more impassioned vernacular, particularly when Tully is arguing a position or describing some especially dramatic moment. However, the result is not problematic. It is Tully's personal passion for the subject that elevates this book above many naval histories, along with his eagerness to present the Japanese point of view. This is a perspective that with few exceptions is lacking in Western accounts.

RICHARD NORTON
Naval War College



Busch, John Laurence. *Steam Coffin: Captain Moses Rogers and the Steamship Savannah Break the Barrier*. New Canaan, Conn.: Hodos Historia, 2010. 726pp. \$35

One of the great events in American, and indeed world, maritime history occurred in the summer of 1819, when the American steamship *Savannah*, commanded by Captain Moses Rogers, became the first steam-powered vessel to cross the Atlantic Ocean. Its pioneer

voyage from Savannah, Georgia, to Liverpool, England, in May and June 1819 is sometimes mentioned as an epoch-making event that marked the coming age of the steamship. While the ship was remembered 140 years later, when in 1959 its name was given to the first American nuclear-powered merchant vessel, the context and the details of the pioneer voyage were overlooked. The 1819 voyage was quickly dismissed as a commercial failure in which steam power was used for only a fraction of the time; the ship itself was forgotten as a short-lived phenomenon after its shipwreck on Long Island in 1821.

Certainly, *Savannah* was far ahead of its time, as it would take another twenty years for steamships to begin regular transatlantic passages and thirty years before there was another American steamship to carry the flag across the Atlantic. Despite all the innovation that the 1819 voyage of *Savannah* represents, however, there is remarkably little historical investigation of it. *Savannah's* captain, Moses Rogers, has been almost completely overlooked as an innovator. Up until the appearance of this fine work, Frank O. Braynard's 1963 study *S.S. Savannah the Elegant Steam Ship* was the only major work on the subject.

For the Connecticut-based independent historian John Laurence Busch, the tale of Captain Rogers and his steamship *Savannah* is clearly a passionate labor of love. With exemplary research, Busch followed an archival trail that led to twenty-two historical manuscript depositories in the United States, ranging from Portland, Maine, to Savannah, and which included ten massive record groups in the National Archives.

Moreover, following the wake of the ship, Busch's research carried him to archives in Denmark, Russia, Sweden, and the United Kingdom. Equally impressive is his productive research in nearly 150 contemporary newspapers that matches his archival range and extends beyond to India, Ireland, and Norway. All of this, Busch has marshaled into a beautifully written and engaging narrative that places his solidly based factual details within a broad context. It is a complex story, but one that is clearly presented.

The book opens with an evocative description of Moses Rogers's involvement in the introduction of the first steam passenger service between Charleston, South Carolina, and Savannah, Georgia. The author then traces back to the early rise of steam propulsion in the United States and Moses Rogers's story from his birth in New London, Connecticut, through his career as a pioneer steamboat captain on the Hudson River, then as steamship designer and founder of the Savannah Steamship Company. In detailing *Savannah's* pioneer transatlantic voyage, Busch effectively covers the entire range of issues from finances to the many different characters in the ship's company. Not stopping there, he explores the public reception and professional interest in the ship's further onward passages to Denmark, Sweden, and Russia, including its return home across the Atlantic. In conclusion, Busch reflects that while the achievements of Rogers and *Savannah* have sometimes been lost to collective memory, they broke a psychological barrier that had hindered such technological innovation up to that point.

Produced by a heretofore-unknown publisher, *Steam Coffin* is enhanced by more than a dozen well-drawn maps, as well as more than forty illustrations. Seventy-one pages of endnotes document Busch's prodigious research, but they are not easy to use, as they are

linked to the text by quoted phrases rather than numbered positions. Nevertheless, John Laurence Busch has made a major contribution to American maritime history with this fine book.

JOHN B. HATTENDORF
Naval War College

OF SPECIAL INTEREST

U.S. ARMY WAR COLLEGE STRATEGIC LANDPOWER ESSAY CONTEST 2012

The U.S. Army War College (USAWC) and the USAWC Foundation have announced this year's annual Strategic Landpower essay contest. Essay topics must relate to the strategic use of landpower; specific topics of interest this year are the future of landpower, the strategic role of landpower, and the Army's role in national security. The USAWC Foundation will award \$4,000 to the author of the best essay and \$1,000 to the second-place winner. Essays must be original, be not over five thousand words in length, and not have been previously published. Entries must be postmarked on or before 17 February 2012. For more information, contact Dr. Michael R. Matheny, U.S. Army War College, Department of Military Strategy, Planning and Operations, at (717) 245-3459, DSN 242-3459, or at michael.matheny@us.army.mil.

AWARD OF THE FIRST HATTENDORF PRIZE

On 20 October, in a brief ceremony during the Naval War College's twentieth International Seapower Symposium, the Chief of Naval Operations, Admiral Jonathan W. Greenert, USN, and the Royal Navy's First Sea Lord, Admiral Sir Mark Stanhope, joined the President of the College, Rear Admiral John N. Christenson, USN, and Professor John B. Hattendorf in recognizing British naval historian N. A. M. Rodger as the inaugural Hattendorf Prize laureate. Symposium delegations from 111 nations were present in the audience. (See our Summer 2011 issue, "Of Special Interest," for the foundation of the prize and the choice of Professor Rodger as its first winner.)

Christenson recognized the great generosity of the donor, Pam Ribbey, whose late grandfather, Captain Charles H. Maddox, was a 1935 and 1939 Naval War College graduate and a faculty member from 1939 to 1941. The donation of the prize was made in memory of Captain Maddox, who played an instrumental role in intelligence collaboration between the U.S. Navy and the Royal Navy in the Pacific in the late 1930s and was serving at Pearl Harbor during the attack. Recognizing her grandfather's service, Pam Ribbey endowed the prize on the

anniversary of the Pearl Harbor attack, 7 December 2010. This endowment fund will allow the Naval War College to award the prize at two-year intervals, providing a \$10,000 cash prize with a citation and a bronze medal.

REFLECTIONS ON READING

Professor John E. Jackson is the Naval War College's Manager for the CNO's Navy Professional Reading Program.

This is the land of the free—in more ways than one! One dictionary definition of the word “free” is “enjoying personal rights or liberty.” America is known as the land of the free, and the nation’s military forces remain vigilant to maintain this freedom. But another meaning of “free” is “at no charge or no cost.” A basic tenet of the CNO’s Navy Professional Reading Program (NPRP) is that books should be made available for free to sailors throughout the fleet. Over 1,200 lending libraries of NPRP books have been established on board ships, in squadrons, and at naval facilities around the globe. Books can be checked out at no cost from each of these libraries. But there is another way sailors can borrow books on the NPRP list: thirty-three of the sixty titles are available at the Navy General Library section of the Navy Knowledge Online (NKO) website, www.nko.navy.mil.

NKO is a remarkable resource that is available to all active-duty, retired, or reserve personnel (and their dependents) of the Navy, Marine Corps, and Coast Guard. Civil Service personnel and contractors working for the Department of the Navy are also eligible to open NKO accounts. Once registered, users can go to the Navy General Library Program site to find over a hundred thousand books, magazines, periodicals, songs, and videos—*for free!* The rules vary for the use of different forms of digital media. Some material can be downloaded for specific periods of time and expire or are automatically deleted from personal computers or portable devices at the end of the lending period. In other cases, users can download and keep the material indefinitely. Among the thirty-three titles available to download through NKO are such popular books as these:

Lone Survivor, by Marcus Luttrell, the story of Navy SEALs in combat in Afghanistan, is available as a downloadable electronic book (e-book) that can be displayed on computers or on portable devices such as Kindles or iPads and also as an audiobook that can be downloaded to MP3 players and other audio devices.

The Last Stand of the Tin Can Sailors, by James D. Hornfischer, a powerful book about Navy surface warfare in World War II, is available both as an e-book and as an audiobook.

Moneyball: The Art of Winning an Unfair Game, by Michael Lewis (and now a major motion picture starring Brad Pitt), a great case study of analysis and personnel management set in a major-league baseball team, is available as an audiobook.

Freakonomics: A Rogue Economist Explores the Hidden Side of Everything, by Steven D. Levitt and Stephen J. Dubner, a best-selling book that offers alternative ways of looking at fads and trends and encourages readers to consider the possibility that things are not always what they appear to be, is available on NKO as an audiobook.

The Navy Professional Reading Program was established to encourage all sailors to expand their horizons by reading (or perhaps by listening to) books about subjects that interest them. With a little searching, you should be able to find an NPRP library aboard ship or at your base, where you can borrow the books at no cost. NKO provides another source for this material, and much more. Finally, books from the NPRP can be purchased at the Navy Exchange at a significant discount, if you want to retain them as part of your professional library.

It's a free country—and you are always free to learn!

JOHN E. JACKSON

